UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

GENLYTE THOMAS GROUP LLC, Plaintiff/Counterclaim Defendant, v. ARCHITECTURAL LIGHTING SYSTEMS, a division of ARCH LIGHTING GROUP, Defendant/Counterclaimant.	Civil Action No. 05-CV-10945 REK

DEFENDANT'S MARKMAN STATEMENT

Pursuant to agreement of the parties and in preparation for the "Markman" hearing scheduled by the court, Defendant, Arch Lighting Group, Inc. (ALS), submits this statement setting forth the appropriate interpretation of the claims of U.S. Patent No. 5,038,254 ("the '254 patent"). A copy of the '254 patent is attached hereto as Exhibit 1.

I. BACKGROUND

Plaintiff Genlyte Thomas Group, LLC ("Genlyte") and ALS are both in the business of designing, manufacturing, marketing and selling lighting fixtures. With respect to the present action, both Genlyte and ALS sell a multifunction lighting fixture for hospital patient rooms. The lighting fixtures from both companies include separately controllable lights within the fixture to provide lighting for different needs within a hospital room. The needs relate to lighting levels at different locations in a hospital room. In particular, the fixtures provide ambient lighting to the room, lighting for a patient to read, lighting for a doctor to examine the patient, and lighting for a nurse to view a chart without disturbing the patient.

Genlyte began selling its medical lighting fixture in approximately 1991 When ALS developed its product, approximately ten years later, it was well aware of the Genlyte product and that Genlyte had various intellectual property rights relating to its products. Accordingly, ALS designed its lighting fixture so as to differ significantly from the Genlyte product while still providing the functions necessary for a hospital room light. Thus, the ALS product uses different bulbs, different bulb orientations, different reflectors, and different lenses than Genlyte's product. The differences designed into the ALS product provide different light distributions from those in Genlyte's product for each function of the lighting fixture.

The claims of the '254 patent recite the structures and light distributions found in Genlyte's product. Despite the differences between the ALS and Genlyte products, Genlyte asserted that the ALS was infringing the '254 patent. ALS denied infringement and provided one of its products to Genlyte for testing. The testing showed that all of the lights in the ALS product have a similar light distribution pattern, while the claims of the '254 patent require differently directed lights, as discussed below. Nevertheless, Genlyte maintained its clearly unsupported assertion of infringement and filed the present action.

II. LEGAL STANDARDS FOR CLAIM INTERPRETATION

Patent infringement is a two step process. First, the Court must determine the meaning of the claims. *Markman v. Westview Inst. Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995)(en banc), *aff'd* 517 U.S. 370 (1996). Second, the claims, as interpreted, are compared to the accused product to determine infringement. *Allen Eng'g Corp. v. Bartell Indus. Inc.*, 299 F.3d 1336, 1345 (Fed. Cir. 2002). The claim interpretation step is a legal question to be decided by the Court. *Markman*, 52 F.3d at 977. The claims are to interpreted on an objective basis as they would be understood by one of ordinary skill in the art at the time the invention. *Markman*, 52 F.3d at 986.

The starting point for claim construction is always the language of the claims themselves. *Renishaw PLC v. Marposs Societa' Group, Inc.*, 262 F.3d 1243, 1248 (Fed. Cir. 1988)("claim construction … begins and ends in all cases with the actual words of the claim"). The terms in a patent claim are generally "given their ordinary and customary meaning" as understood by one of ordinary skill in the art to which the invention applies. *Phillips v. AWH Corp.*, 415 F.3d. at 1312-13; *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, (Fed. Cir. 2002); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). "In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Phillips*, 415 F.3d at 1314 (citing *Brown v. 3M*, 265 F.3d 1349, 1352 (Fed. Cir. 2001)("the claims 'did not require elaborate interpretation'").

Although claim terms are typically interpreted consistent with their ordinary meaning, a patentee may be his or her own lexicographer and use terms in a manner different from their ordinary meaning. *Vitronics*, 90 F.3d at 1582. A patentee may also use terms which have no ordinary meaning. When doing so, the patentee must clearly state the special definition or meaning of such terms in the specification or file history of the patent. *Id.* (specification can assist interpretation "when it expressly defines terms used in the claims or when it defines terms by implication."); *Markman*, 52 F.3d at 979-80 (claims "must be read in light of the specification, of which they are part"). When interpreting such terms, the Court should limit its interpretation to defining the terms in the claim. The claims are not to be limited by the preferred embodiment or embodiments disclosed in the specification. *Elkay Manuf. Co. v. Ebco*

Manuf. Co., 192 F.3d 973, 978 (Fed. Cir. 1999) ("The general rule, of course, is that the claims of a patent are not limited to the preferred embodiment, unless by their own language.").

Extrinsic evidence –evidence other than the patent and the file history – is less relevant and reliable in interpreting the meaning of the claims. *Phillips*, 415 F.3d at 1317-18 extrinsic evidence cannot provide definitions which contradict the intrinsic evidence 1322-23; *Vitronics*, 90 F.3d at 1584, n.6. Nevertheless, expert testimony can be useful for a variety of purposes in construing the claims. Such testimony provides the court with background on the technology and an understanding of how one of ordinary skill in the art would interpret the claims. The claim constructions set forth below are supported by the Statement of Ian Lewin (attached as Exhibit 2), as one of ordinary skill in the art of lighting design.

III. CLAIM INTERPRETATION OF THE '254 PATENT

The '254 patent, titled Integrated Medical Light System, issued August 6, 1991. The '254 patent relates to a ceiling mounted medical lighting system including a reading light, an examination light, and an ambient light. As disclosed in the '254 patent, each light directs light to a different portion of a hospital bed for a different purpose The reading light is directed toward a reading area on a hospital bed directly below the fixture. The examination light is directed to the entire top surface of the hospital bed. The ambient light is directed to a wall abutting the head of the hospital bed so that it is reflected back to a large area in the vicinity of the hospital bed.

The patent includes fourteen claims, two of which, claims 1 and 3, are independent. An independent claim recites all of the elements necessary to infringe the claim. A dependent claim references another claim and necessarily includes all of the elements recited in the claim itself and recited in the claim or claims from which it depends.

The discussion below does not include every term of all of the claims. The parties, through counsel, have discussed the claims and the terms which are believed to require interpretation by the Court due to disputes as to how these terms should be understood. All disputed terms are discussed in this statement. All terms which are not discussed are believed by both parties to retain their ordinary meaning and to be clear. Furthermore, ALS asserts that most of the disputed terms also are to be interpreted in accordance with their "ordinary and customary" meanings. The meaning of the terms which have no ordinary meaning are clear from the disclosure of the '254 patent.

A. Claim 1

Claim 1 of the '254 patent is directed to "a medical lighting system" and includes four elements:

1. a body;

2. means for ceiling-mounting said body;

3. a first light fixture within said body oriented to direct light downwardly to a selected reading area under said body;

4. a second light fixture within said body oriented to direct light downwardly and outwardly to a vertical wall surface outwardly adjacent from said body whereby light is reflected back to a broad area under said body.

The terms which require interpretation are underlined above.

1 *Means for Ceiling-Mounting Said Body*

The second element of claim 1 recites means for mounting the body of the lighting system on the ceiling. This element is in means-plus-function format and is to be interpreted pursuant to 35 U.S.C. § 112, paragraph 6. The patent statute provides that claim elements may

be written as means for performing specified functions without recitation of specific structures which perform those functions. Such claim elements are to be interpreted to include the structures shown in the specification for performing the recited functions, and equivalents thereof. In interpreting such an element, the Court must first determined the recited function. Once the function is determined, the Court is to determine the structures recited in the specification for performing function. Claim interpretation requires both the determination of the function and determination of the disclosed structure or structures.

With respect to claim 1, the recited function is mounting the body on the ceiling. However, the specification of the '254 fails to disclose any structures for performing that function. Therefore, this claim element cannot be fully interpreted by the court. When the specification fails to recite any structure for performing a function recited in the claim, the claim is invalid. *Atmel Corp. v. Information Storage Devices*, 198 F.3d 1374, 1378-1379 (Fed. Cir. 1999); *In Re Donaldson*, 16 F.3d 1189, 1195 (Fed. Cir. 1994). While the issue of invalidity not currently before the Court in connection with its claim interpretation, the court will be unable to provide a complete interpretation of this element as a result of the lack of any structure in the specification.

2. *Oriented to direct light*

The third element of claim 1 recites a first fixture within the body oriented to direct light. The term "oriented to direct light" is used repeatedly throughout the claims of the '254 patent. This term can be interpreted in accordance with its ordinary meaning. "Oriented," within the context of the claims, means "to put in correct position or relation". *See* excerpts from Webster's Third International Dictionary (hereinafter "Websters"), attached as Exhibit 3. "To direct" means "to follow a straight course with a particular destination". Websters, Exhibit 3. Thus, the

first light fixture is defined by a structure positioned to aim light emitted by the fixture to a destination. As discussed by Dr. Lewin, one of ordinary skill in the art would understand that "directing light" means that the majority of the light or the highest intensity light from the fixture is purposely directed towards a target. See Statement of Ian Lewin, p. 2. Light from any fixture is dispersed in many directions. However, the recitation in the claims of the light being "directed" requires that the light be aimed in a direction. This is understood by those of ordinary skill in the art as a reference to the majority of the light or the part having the highest intensidy. If only a small portion of the light is emitted by a fixture in a recited direction, the light cannot be considered to be directed in that direction. Claim 1 further identifies how the light is aimed by identifying a direction and a target area to which the light from the fixture is directed.

If claim 1 were interpreted so as not to be limited to the highest intensity light being aimed in the direction towards the recited target, the claim would be invalid. Various prior art patents disclose lighting fixtures providing light from different sources in many directions. See Statement of Ian Lewin, pp. 6-10. Claim of the '254 patent differs from these prior art patents in that it recites directing the light in specific directions to a specific target area. Generally, claims should be interpreted to preserve validity. *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577 (Fed.Cir.1984) ("claims should be so construed, if possible, as to sustain their validity"). Therefore, claim 1 should be interpreted to require the highest intensity light to be aimed in the recited direction to the recited target.

3. *Downwardly*

Claim 1 recites that the first fixture directs the light downwardly. This term provides the direction for the highest intensity of the light. The ordinary meaning, decending from a source

(Websters), can be used for this term. Downwardly means that the light is aimed below the first fixture. See Statement of Ian Lewin, p. 2

4. *A Selected Reading Area*

The target area recited in claim 1 is "a selected reading area under said body." This term has no ordinary or customary meaning. Thus, according to the principles of claim interpretation, the specification must be used in determining the meaning of this term. The claim itself identifies the reading area as being under the body or the light fixture. The specification identifies the reading area by reference number 400 in Fig. 1. It further indicates an objective of the invention as providing a reading light for illumination over an area appropriate for a patient reading in bed. ('254 patent, col. 1, lines 42-47; col. 2, lines 3-6). Thus, the reading area is a defined area under the lighting system body used by a patient for reading. See Statement of Ian Lewin, pp. 2-3.

5. *Second Light Fixture – Oriented to Direct Light*

The final element recited in Claim 1 is a second light fixture within the body oriented to direct light. The term "oriented to direct light" has the same meaning as discussed above with respect to the first light fixture. The second light fixture is arranged to aim the light in a given direction. As discussed above, the terms "to direct light" means that the majority of light or highest intensity light is aimed in the given direction.

6. *Downwardly and outwardly*

Claim 1 recites the direction of the light from the second light fixture as "downwardly and outwardly." This differs from the direction of light from the first fixture which was just "downwardly." Downwardly refers to a direction below the fixture. Outwardly means toward the outside or in an outward direction. Websters, Exhibit 3. Downwardly and outwardly, when

used jointly, mean a direction which is below, yet outside the area of the body. This direction is consistent with the target area, the vertical wall surface, as discussed below. See Statement of Ian Lewin, pp. 3-4.

7. *A Vertical Wall Surface Outwardly Adjacent From Said Body*

The target area for light from the second fixture is recited in the claim as "a vertical wall surface outwardly adjacent from said body." This term is interpreted in accordance with its ordinary meaning. The body is mounted horizontally on or in the ceiling. The target for the second light fixture is a vertical wall. The wall is one which is adjacent, i.e., next to or near, the body, which is mounted on the ceiling.

8 *Reflected Back To A Broad Area*

The target area for the light from the second fixture is further defined by an area to which light is reflected from the wall. Light from the second fixture is aimed at a wall so that it is reflected back off the wall. The light is reflected off the wall to a broad area under the body. As with the reading area, the broad area has not ordinary meaning. The specification identifies the "broad area" as a wide or large area around the patient's bed under the lighting system. ('254 patent, col. 1, lines 42-45; col. 2, lines 6-10).

9. *Summary*

Claim 1, when properly interpreted, requires, among other things, two light fixtures oriented to direct light in two distinct manners. Directing light, in this context, means that the highest intensity light is pointed in a direction to a defined target area. The first fixture directs light in a downward direction to an area, under the body of the lighting system, useful for a patient in a bed under the fixture to read. The second fixture directs light in a downward and

outward direction to a vertical wall so that it is reflected back to an area around a patient bed under the fixture.

Furthermore, this interpretation of claim 1 is consistent with the invention as disclosed in the specification. Fig. 1 illustrates light from the fixtures. The light from the first fixture is shown as exiting the fixture at an angle so as to remain under the body of the lighting system. Fig. 1 further illustrates a reading area 400 as being a portion of the bed. Light from the second fixture is shown as proceeding at an angle away from the fixture to the wall and by the heand of you bed.

B. Claim 3

Independent claim 3 also recites a medical lighting system. It includes five elements. The first four elements are worded identically to the elements of claim 1 These elements should be interpreted in the same manner as discussed above with respect to claim 1. The fifth element recites: "a third light fixture within said body oriented to direct light downwardly under said body to a selected patient examination area." As with the elements of claim 1, the term "oriented to direct light" should be interpreted to mean that fixture has a structure which causes the highest intensity light to be aimed in a direction towards a target. With respect to the third light fixture, the direction is "downwardly" and should be interpreted in the same manner as the direction for the first light fixture discussed above. However, the target area is different for the third light fixture. Claim 3 recites the target area as a selected patient examination area. "Patient examination area" has no ordinary or customary meaning. The specification of the '254 patent, however, clearly identifies the patient examination area as "the entire area of the patient's bed." ('254 patent, col. 1, lines 47-49; col. 2, lines 10-17.) See statement of Ian Lewin, p. 5.

Thus, similar to claim 1, claim 3 should be interpreted to require three light fixtures, each of which cause the highest intensity of light from the fixture to be aimed in the recited direction to a recited target. For the first and third fixtures, the direction is downward below the body of the lighting system. The target area for the first fixture is a portion of the bed area of a patient bed under the lighting system. The target area for the third fixture is the entire patient bed. The second light fixture directs the highest intensity light in a direction downward and outward away from the lighting system to a vertical wall. The light is directed so that it reflects off the wall to a large area around the patient bed.

C. Dependent Claims

Genlyte has asserted infringement of all of the claims of the '254 patent. Claim 2 depends from claim 1. Claims 4-14 depend, directly or indirectly, from claim 3. The dependent claims recite additional features of the various light fixtures of claims 1 and 3. While most of the terms of these dependent claims are clear and receive their ordinary meaning. The parties believe that several terms in these claims require interpretation.

1. *Reflector*

Claims 2 and 4 recite that the first and second light fixtures each include a reflector and a fluorescent bulb. A "reflector" is a known structure in a lighting fixture which causes light to be distributed or directed. Reflectors can have different shapes and surfaces. The reflectors, as recited in claims 2 and 4, are specular or semi-specular surfaces shaped and positioned to reflect light from the bulb in the direction recited in claims 1 and 3. Specular and semi-specular surfaces are a necessary part of claims 2 and 4 so that the light is directed toward the defined target. Diffuse surfaces, which can also be used as reflectors in light fixtures, provide a broad light distribution without providing a directionality of higher intensity light. See Statement of

Ian Lewin, p. 6. Thus, a diffuse surface fails to operate in accordance with the terms of the claims as is excluded from the meaning of the claims of the '254 patent.

2. *Fluorescent Assembly*

Claim 4 recites that the third fixture includes a reflector and fluorescent assembly therein. A fluorescent assembly includes one or more bulbs within a single reflector. See Statement of Ian Lewin, p. 6. The '254 patent discloses two or four bulbs within a single reflector for the examination light. See Fig. 2, col. 2, line 66 – col. 3, line 4.

3. *Light Distribution Pattern*

Claims 5 and 7, which depend from claim 4, recite that the bulbs in the fluorescent assembly have "a light distribution pattern oriented in a direction perpendicular to the ... fluorescent bulbs." A light distribution pattern is a term of art within the lighting industry which means the direction where the major intensity of the light from a bulb is directed. Claims 5 and 7 recite that the major intensity of light from a bulb must be perpendicular to the axis of the bulb.

4. *Glare*

Claims 13 and 14, which depend from claim 3, recite that the fixtures set forth in claim 3 exclude glare from certain areas. Claim 13 recites that the first and second fixtures exclude glare from being directed to a forward area of a standard hospital bed. Claim 14 recites that the first and second fixtures exclude glare from areas adjacent to a standard hospital bed. Glare, under either its ordinary meaning or as understood within the art of the invention, means a level of luminance which causes annoyance, discomfort or loss of visual performance. Claim 3 recites that the fixtures direct light of the highest intensity to specific target areas. Claims 13 and 14 require the light outside the target area to have a sufficiently low intensity so as to not bother persons at those areas.

IV. CONCLUSION

The claims of the '254 patent generally can be interpreted in accordance with the ordinary meaning of the language used in the claims. Such interpretation provides that each of the fixtures recited in the claims cause the highest intensity of light from the fixture to be directed in a defined direction to a defined target location. Furthermore, as recited in the claims, the first and second fixtures direct light in different directions to significantly different target areas.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that this document filed through the ECF system will be sent electronically to the registered participants as identified on the Notice of Electronic Filing (NEF) and paper copies will be sent to those indicated as non-registered participants on May 18, 2006.

Brett N. Dorny

DEFENDANT'S MARKMAN STATEMENT

EXHIBIT 1

United States Patent [19]

Fabbri et al.

[11] **Patent Number: 5,038,254**

[45] **Date of Patent: Aug. 6, 1991**

[54] **INTEGRATED MEDICAL LIGHT SYSTEM**

[75] Inventors: **Wiliam C. Fabbri**, Billerica; **Roy Crane**, Wilmington, both of Mass.

[73] Assignee: **Keene Corporation**, Union, N.J.

[21] Appl. No.: **629,436**

[22] Filed: **Dec. 18, 1990**

[51] **Int. Cl.**[5] **F21V 13/00**

[52] **U.S. Cl.** **362/33**; 362/225; 362/147; 362/804

[58] **Field of Search** 362/33, 225, 240, 364, 362/147, 804

[56] **References Cited**

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Primary Examiner—Stephen F. Husar

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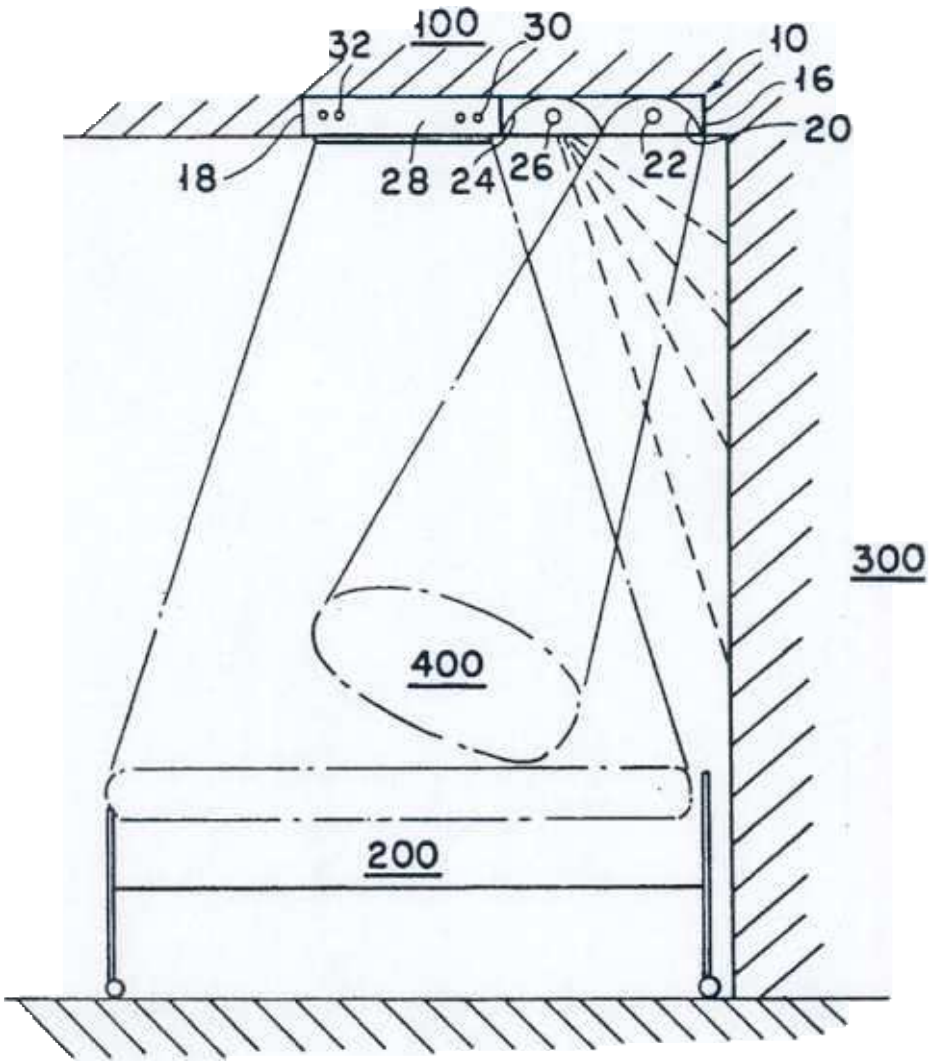
[57] **ABSTRACT**

The apparatus is a medical lighting system which includes a ceiling-mount reading light, examination light and ambient light. The reading light is directed toward a selected reading area on a hospital bed directly below the medical lighting system. The examination light illluminates the entire top surface of the hospital bed. The ambient light directs light to a wall abutting the head of the hospital bed thereby providing reflected light to the vicinity of the hospital bed.

14 Claims, 2 Drawing Sheets



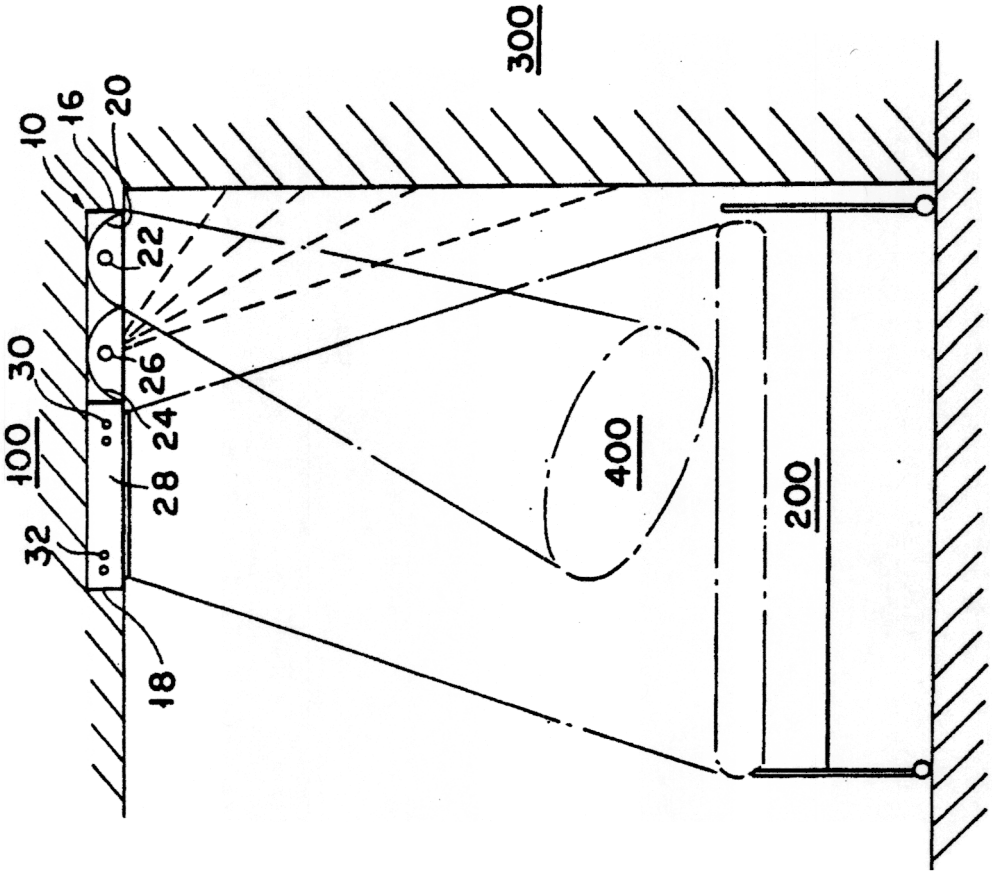


FIG.

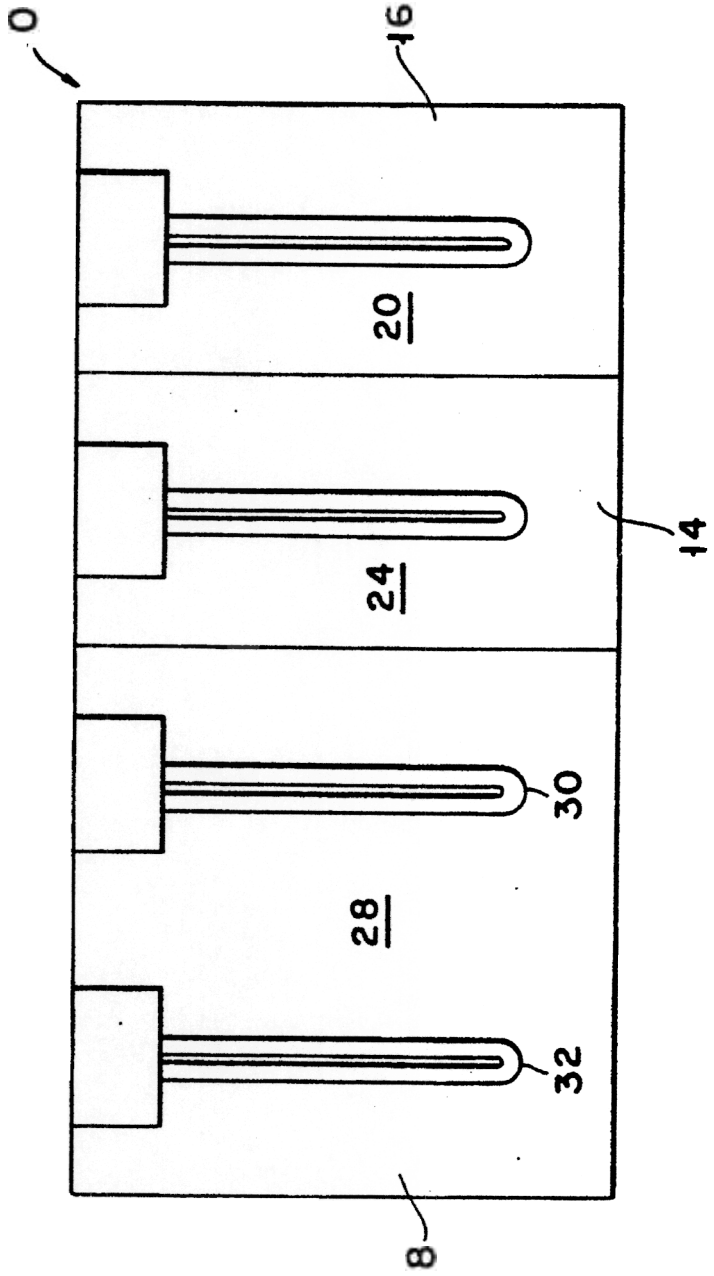


FIG. 2

INTEGRATED MEDICAL LIGHT SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention pertains to a light system for use in hospitals and health facilities. The light system includes an examination light, an ambient light, and a reading light and is preferably mounted in the ceiling.

2. Description of the Prior Art

In hospitals and similar health or medical facilities, it is desirable to provide the bedridden patient with three types of lights—the first is an ambient light which provides background, preferably reflected, light to a large area surrounding the bed; the second is a reading light which provides direct light to a portion of the patient's bed; and the third is an examination light which directs a high intensity light to substantially the entire area of the patient's bed. The ambient light typically has an illumination value of approximately 50 foot-candles while the reading light typically has an illumination value of approximately 70 foot-candles and the examination light typically has an illumination value of approximately 100 foot-candles.

In the prior art, these lights were typically provided individually in a haphazard way. Different types of lamps and light fixtures were placed around the bed with numerous plugs competing with medical equipment for available outlet space. Moreover, such an arrangement was unsightly and could impede the mobility of the patient, the patient's bed, or the surrounding medical equipment.

Wall-mounted fixtures alleviated some of the above-identified deficiencies but still left much to be desired aesthetically and, more importantly, could impede access to the patient, and were easily damaged by motor driven bed headboards.

OBJECTS AND SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide an integrated medical lighting system which provides an ambient light with an illumination value of about 50 foot-candles over a wide area; a reading light with an illumination value of about 70 foot-candles over an area appropriate for a patient reading in bed; and an examination light with an illumination value of about 100 foot-candles over the entire area of the patient's bed.

It is therefore a further object of this invention to provide an integrated medical lighting system which requires no more than one or two electrical connections.

It is therefore a still further object of this invention to provide an integrated medical lighting system which does not impede access to the patient, the patient's bed, or surrounding medical equipment.

It is therefore a final object of this invention to provide an integrated medical lighting system which is aesthetically pleasing.

These and other objects are effectively attained by providing a ceiling-mounted medical lighting system which includes three individual dedicated light fixtures. The lighting system is rectangular and is designed to be placed so that one of the shorter ends of the rectangle is placed substantially on the ceiling-wall interface directly over the head of the patient's bed. The bed is placed so that the longer sides of the bed are parallel to the longer sides of the rectangular light fixture.

A first light fixture includes a fluorescent bulb and a reflector designed to direct light toward the forward portion of the patient's bed so as to allow a patient to read comfortably. A second light fixture includes a fluorescent bulb and a reflector designed to direct light toward a vertical wall abutting the head of the patient's bed so as to provide a reflected light over a large area around the patient's bed. A third light fixture includes two to four fluorescent (preferably biax ® or other U-shaped) bulbs which are oriented perpendicularly to the bed. The fluorescent bulbs have a light distribution pattern which is substantially oriented in the direction perpendicular to the bulb. Therefore, the entire area of the bed is efficiently illuminated providing an examination light.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIG. 1 is a side plan view of the integrated medical light system of the present invention.

FIG. 2 is a bottom plan view of the integrated medical light system of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail wherein like numerals indicate like elements throughout the several views, FIG. **1** is a side plan view of lighting fixture **10** shown installed in ceiling **100** directly over bed **200**. FIG. **2** shows the rectangular shape of lighting fixture **10** formed by long sides **12, 14** and short sides **16, 18**. Long sides **12, 14** are typically four feet in length while short sides **16, 18** are typically two feet in length. As shown in FIG. **1**, short side **16** abuts the wall-ceiling (**300, 100**, respectively) interface directly over the head of bed **200**. Long sides **12, 14** are parallel to the longer side of bed **200**.

Reading light reflector **20** is along short side **16** of lighting fixture **10** proximate to wall **300** and includes a fluorescent bulb **22** positioned therewithin parallel to short sides **16, 18** of lighting fixture **10** so as to provide a direct light to reading area **400** of bed **200** as shown on FIG. **1**. Reflector **20** and bulb **22** are chosen to provide an illumination of approximately 70 foot-candles to reading are **400**.

Ambient light reflector **24** is inwardly adjacent to reading light reflector **20** and includes a fluorescent bulb **26** positioned therewithin parallel to short sides **16, 18** of lighting fixture **10** so as to reflect or bounce light from wall **300** thereby providing ambient light to bed **200**. Reflector **24** and bulb **26** are chosen to provide approximately 50 foot-candles of illumination to the ambient area.

Reflectors **20, 24** and bulbs **22, 26** are configured so as not to direct glare toward the head of bed **200** where the patient's head is likely to be, whether in a supine or sitting position. Similarly, reflectors **20, 24** and bulbs **22, 26** are configured so as not to direct glare to areas adjacent to bed **200** so as to allow other beds (not shown) to be placed proximate thereto without undue disturbance of neighboring patients.

Examination light reflector **28** is outwardly adjacent to ambient light reflector **24**, includes short side **18** and is opposite from reading light reflector **20**. Examination

light reflector 28 includes two to four fluorescent bulbs 30, 32. Fluorescent bulbs 30, 32 (preferably biax ® or other U-shaped) are parallel to short sides 16, 18 of lighting fixture 10. As fluorescent bulbs 30, 32 have a characteristic directional light distribution pattern oriented in the direction perpendicular to the bulbs, the entire area of the bed 200 is efficiently illuminated. The bulbs 30, 32 and reflector 28 are chosen to provide 100 foot-candles of illumination to the bed 200. An important feature of the present invention resides in the orientation of the lamps within the lighting 1 fixture which permits the lighting fixture 10 to be packaged in a two foot by four foot configuration and thereby replace a conventional troffer.

Bulbs 22, 26, 30 and 32 are powered by a single electrical source, preferably supplied from wiring within ceiling 100 although the use of a single electric cord (not shown) engaging an electrical socket (not shown) may be used. A single switch module (not shown), either hand-held or built into wall 300, is used to control bulbs 22 and 26 and a wall switch to control bulbs 30 and 32.

To use this device, the patient operates the switch module (not shown) to operate selectively bulbs 22 and 26. Medical personnel control bulbs 30 and 32 of the examination lighting from a switch on the headwall, not easily accessible to the patient.

Thus the several aforementioned objects and advantages are most effectively attained. Although a single preferred embodiment of the invention has been disclosed and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

What is claimed is:

1. A medical lighting system comprising:

a body;

means for ceiling-mounting said body;

a first light fixture within said body oriented to direct light downwardly to a selected reading area under said body;

a second light fixture within said body oriented to direct light downwardly and outwardly to a vertical wall surface outwardly adjacent from said body whereby light is reflected back to a broad area under said body.

2. The medical lighting system of claim 1 wherein said first light fixture includes a first reflector and a first fluorescent bulb therewithin; and said second light fixture includes a second reflector and a second fluorescent bulb therewithin.

3. A medical lighting system comprising:

a body;

means for ceiling-mounting said body;

a first light fixture within said body oriented to direct light downwardly to a selected reading area under said body;

a second light fixture within said body oriented to direct light downwardly and outwardly to a vertical wall surface outwardly adjacent from said body whereby light is reflected back to a broad area under said body;

a third light fixture within said body oriented to direct light downwardly under said body to a selected patient examination area.

4. The medical lighting system of claim 3 wherein said first light fixture includes a first reflector and a first fluorescent bulb therewithin; said second light fixture includes a second reflector and a second fluorescent bulb therewithin; and said third light fixture includes a third reflector and a fluorescent assembly therewithin.

5. The medical lighting system of claim 4 wherein said fluorescent assembly includes at least one fluorescent bulb with a light distribution pattern oriented in a direction perpendicular to said at least one fluorescent bulb.

6. The medical lighting system of claim 5 wherein said at least one fluorescent bulb is a "biax"-type bulb.

7. The medical lighting system of claim 5 wherein said fluorescent assembly includes at least two fluorescent bulbs with a light distribution pattern oriented in a direction perpendicular to said at least two fluorescent bulbs.

8. The medical lighting system of claim 7 wherein said at least two fluorescent bulbs are "biax"-type bulbs.

9. The medical lighting system of claim 5 wherein said body is rectangular and a first shorter and of said body is designed to abut the vertical wall surface; wherein said first fluorescent light fixture abuts said first snorter end and said first fluorescent light bulb is parallel to said first shorter end; wherein said second fluorescent light fixture is inwardly adjacent to said first fluorescent light fixture and said second fluorescent light fixture is parallel to first shorter end; and wherein said third fluorescent light fixture is outwardly adjacent from said second fluorescent light fixture and abuts a second shorter end of said body; and wherein said at least one fluorescent bulb is parallel to said first shorter end.

10. The medical lighting system of claim 9 wherein said first and second shorter ends are substantially two feet in length and said body includes first and second longer ends which are substantially four feet in length.

11. The medical lighting system of claim 9 wherein said first light fixture illuminates said selected reading area to substantially 70 foot-candles; wherein said second light fixture illuminates said broad area to substantially 50 foot-candles; and wherein said third light fixture illuminates said patient examination area to substantially 100 foot-candles.

12. The medical lighting system of claim 11 wherein said patient examination area is sufficient in size to include a standard hospital bed when said first light fixture is substantially directly over a head of the standard hospital bed, the head of the standard hospital bed substantially abutting the vertical wall surface.

13. The medical lighting system of claim 3 wherein a distribution of light from said first and second light fixtures excludes glare from being directed to a forward area of a standard hospital bed placed below the medical lighting system.

14. The medical lighting system of claim 3 wherein a distribution of light from said first and second light fixtures excludes glare from areas adjacent to a standard hospital bed placed below the medical lighting system.

* * * * *

DEFENDANT'S MARKMAN STATEMENT

EXHIBIT 2

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

GENLYTE THOMAS GROUP LLC, **Plaintiff/Counterclaim Defendant,** **v.** **ARCHITECTURAL LIGHTING SYSTEMS, a division of ARCH LIGHTING GROUP,** **Defendant/Counterclaimant.**	**Civil Action No. 05-CV-10945 REK**

STATEMENT OF IAN LEWIN

May 16, 2006

- **Background and Introduction**

I have been requested by the Law Offices of Brett N. Dorny on behalf of Architectural Lighting Systems ("ALS") to evaluate certain aspects of Patent No. 5,038,254 ('254 patent), inventors Fabbri and Crane, which I understand to be assigned to Genlyte Thomas Group, LLC ("Genlyte").

As background I hold a Ph.D. in Illuminating Engineering, and I have 38 years of professional experience in matters related to the design and use of lighting equipment. I have served as Research Manager for a major lighting manufacturer, and have operated independent lighting product development facilities for a period of 33 years. This has included development of lighting devices for hospital use. I hold 22 US patents for lighting products. I am past-president of the Illuminating Engineering Society of North America, IESNA and have served on numerous national and international standards committees concerning light and lighting equipment. My full Curriculum Vitae is attached as Exhibit A. My CV provides the titles and publication journals of 141 technical papers authored by me on the subject of lighting, many of which have been presented to meetings of scientific organizations and peer reviewed.

Claim Construction

I have reviewed the claims of the '254 patent, and in particular certain specific terms, to ensure that their meaning is clear. I have concentrated on the independent claims, namely claims 1 and 3. During this effort I have analyzed the claim terminology as I believe it would be understood by a person of ordinary skill in the art.

- **Claims 1 and 3. "... oriented to direct light downwardly to a selected reading area."**

Term: "oriented"

Meaning: set and angled

Rationale: In order to achieve emission of the light rays in the required direction, the lighting fixture must be set in a position to allow this to happen and must be angled appropriately for the purpose.

Term: "to direct light"

Meaning: to aim the highest intensity of light

Rationale: The term "direct" has a specific meaning, and refers to the *purposeful directing of the highest intensity of light towards a target.* For example, if a hiker directs his flashlight to a mile marker, he aims the flashlight to the target, which in this case is the mile marker, causing the flashlight's highest intensity to fall on the target. Thus the hiker achieves his purpose, which is to provide enough light for reading of the mile marker. If the hiker aims his light elsewhere, say 10 feet to the left of the mile marker, some light will still fall on the mile marker, but it cannot now be said that he is still directing his light to the mile marker. Thus the ordinary meaning of the verb "direct" in reference to lighting is that the highest or maximum intensity is aimed at a desired target to achieve a specific purpose.

Term: "downwardly"

Meaning: in a direction below a horizontal plane through the fixture

Rationale: The downward component of a lighting fixture is defined in the glossary of the handbook of the IESNA, 8th edition, as "The portion of luminous flux from a luminaire emitted below the horizontal." Exhibit B.

Term: "to a selected reading area"

Meaning: to a reading area on or above the bed.

Rationale: For the claim limitation to have meaning, there must be a target area to which the maximum intensity is aimed. Without a target, the terminology "to direct light" is unclear. This target area, both by claim language and as it will be understood from the specification, is the reading area.

The terminology "oriented to direct light downwardly to a selected reading area" therefore means "set and angled to aim the highest intensity of the light in a direction below a horizontal plane through the fixture to a reading area on or above the bed."

Claims 1 and 3. "... oriented to direct light downwardly and outwardly to a vertical wall surface..."

Term: "oriented to direct light" See above definitions.

Term: "downwardly and outwardly to a vertical wall surface"

Meaning: a single direction below and outwards from the fixture so as to illuminate a vertical wall surface.

Rationale: The vertical wall is the target area for the second light, and therefore it is to this wall that the highest intensity of light is to be directed. This is made clear in the specification: " ... so as to reflect or bounce light from wall 300 thereby providing ambient light to bed 200." Column 2, lines 53-55. The specification further states that the fixture components "are configured so as not to direct glare toward the head of the bed 200 where the patient's head is likely to be ..." Column 2, lines 58-60.

It is apparent to a person skilled in the art, therefore, that a fundamental concept of the invention is the inclusion of a light fixture that preferentially directs light to an end wall, and that the reason for doing so is to reduce brightness of the fixture as seen by the patient, thus eliminating glare.

Such a principle is not simply part of a preferred embodiment, but is rather a basic principle of the covered device. This is clarified under the section "Objects and Summary of the Invention," wherein it is stated "A second light fixture includes a fluorescent bulb and a reflector designed to direct light toward a vertical wall abutting the head of the patient's bed so as to provide a reflected light over a large area around the patient's bed." Column 2, lines 6-10.

A person of ordinary skill in the art will understand that for a light fixture to be effective in providing room ambient lighting through reflection from a wall, the intensity of light directed to the wall must be relatively high. Similarly, such a skilled person will know that prevention of glare to a patient requires a relatively

low intensity of light being directed toward the patient's eyes, other factors being equal.

The basic concept of the second light fixture of the claimed invention, described earlier, necessitates higher intensity in directions toward an end wall than towards the bed, otherwise the second fixture will not be effective and efficient in fulfilling its function. As will be known by a person of ordinary skill in the art, effectiveness and efficiency are essential for an invention as described in the '254 patent to be useful.

The terminology "...oriented to direct light downwardly and outwardly to a vertical wall surface therefore means "set or arranged to aim the highest intensity of the light in a direction below a horizontal plane through the fixture and outwards from the fixture so as to illuminate a vertical wall..."

- **Claims 1 and 3: "... to a vertical wall surface outwardly adjacent from said body whereby light is reflected back to a broad area under said body."**

Term: "outwardly adjacent from said body"

Meaning: that is close to a shorter end of the fixture and adjacent to the head of the patient's bed.

Rationale: To properly comprehend the meaning of this phase, a person of ordinary skill in the art will consult the specification, which states "The light system is rectangular and is designed to be placed so that one of the shorter ends of the rectangle is placed substantially on the ceiling-wall interface directly over the head of the patient's bed." Column 1, lines 65-68.

Term: "reflected back to a broad area"

Meaning: Reflected from the wall to provide illumination over a wide area beneath the body that houses the fixture."

Rationale: The purpose of directing light toward the end wall is so that reflected light from the wall provides the room ambient illumination, rather than such illumination being created directly by the fixture, where it might create glare to the patient.

Thus the terminology "to a vertical wall surface outwardly adjacent from said body whereby light is reflected back to a broad area under said body" means "to a vertical wall surface that is close to the shorter end of the fixture and adjacent to the head of the patient's bed, whereby light is reflected from the wall to provide illumination over a wide area beneath the body that houses the fixture."

- **Claim 3 "... oriented to direct light downwardly under said body to a selected patient examination area."**

Term: oriented to direct light downwardly

Meaning: See above

Term: "... to a selected patient examination area"

Meaning: to an area on or above the bed

Rationale: Just as the first and second lights have target areas to where the highest light intensity is directed, so must the third light, in order to give meaning to the limitation. In this case the target area is the patient on the bed.

The terminology "... oriented to direct light downwardly under said body to a selected patient examination areas" means "... set and angled to aim the highest intensity of the light in a direction below a horizontal plane through the fixture to the area on or above the bed."

- **Additional Consideration Regarding the Second Light of Claims 1 and 3.**

The meaning of the terminology "... to direct light downwardly and outwardly to a vertical wall surface ..." has been discussed and clarified above. It should be recognized that any alternative understanding of this limitation, whereby "to direct light" is said to encompass the mere spilling of light onto and end wall, without the purposeful aiming of the highest intensity towards the wall, is incorrect. Firstly, use of the verb "direct" in the lighting industry has been illustrated earlier by the analogy of the hiker and flashlight. Secondly, it is my opinion that the language of claim 1 and 3 of the '254 patent that relates to the second light would be meaningless unless it is interpreted as requiring higher intensity of light being directed to an end wall versus elsewhere. Unless interpreted in this sense, the claim language concerning the second light would be descriptive of virtually any ceiling mounted lighting fixture. Hundreds of commercial lighting products are available for general lighting, or "ambient" lighting in the words of the patent, that provide light in both downward and outward directions towards a wall, but that have higher intensities straight down rather than to a wall. Thus the claim language is meaningless unless it is applied with the understanding that more light, in terms of higher intensity, is directed towards an end wall than elsewhere. As has been made clear in the specification, the inventors intended that "the second light includes a fluorescent bulb and a reflector designed to direct light to a vertical wall abutting the head of the patient's bed so as to provide a reflected light over a large area around the patient's bed." Column 2, lines 6-10.

- **Claims 2 and 4 "...reflector..."**

Term: "reflector"

Meaning: a semi-specular or specular surface shaped and positioned to reflect light from a fluorescent bulb in a desired direction.

Rationale: When it is required to aim reflected light in a specific target direction, and such aiming cannot be created simply by a chosen orientation of the tubes, a semi-specular or specular reflecting surface is required to provide the desired directionality.

- **Claims 5 and 7. "...fluorescent assembly..."**

Term: "fluorescent assembly"

Meaning: One or more fluorescent bulbs within a single reflector.

Rationale: Each fluorescent assembly consists of one or more fluorescent bulbs that are grouped within a particular fixture and are optically controlled by a reflector.

- **Claims 5 and 7. "...with a light distribution pattern oriented in a direction..."**

Term: "a light distribution pattern"

Meaning: The direction(s) where the major intensity of light is projected.

Rationale: The claim is describing the main projection of light from a fluorescent bulb, which is perpendicular to the axis of the bulb, and which can be identified by the major intensity from the tube.

- **Claims 13 and 14. "...excludes glare from being directed..."**

Term: "glare"

Meaning: A sense of annoyance, discomfort or loss in visual performance or visibility created by excessive luminance.

Rationale: Definition of glare, Handbook of IESNA, 8th Edition, Glossary of terms. Exhibit H.

Prior Art Issues Related to Invalidity

I have been requested to locate and review materials that may be considered to be prior art to the '254 patent. I have secured and reviewed the following:

U.S. Patent no. 2,557,129 ('129 patent) Inventor: McDaid. "Spotlighting Unit" Date of issue: June 1, 1948. Exhibit C.

U.S. Patent no. 4,816,969 ('969 patent) Inventor: Miller. "Wall-mounted over Bed Lighting Fixture" Date of issue: March 28, 1989. Exhibit D.

I have further examined the 8th edition of the Handbook of the Illuminating Engineering Society of North America, specifically the section devoted to luminaires, (i.e. lighting fixtures).

- The '129 Patent. Exhibit C.

The '129 patent discloses a spotlight that attaches to a ceiling lighting fixture.

The spotlight, and the ceiling fluorescent light to which it is attached, form a composite light device with multiple uses. The spotlight can be employed to direct light to a specific area, and as such it can function as a reading light. The ceiling fluorescent light is simply described as "a ceiling type fixture," which a person of ordinary skill in the art will understand can be used for the purpose of providing general or ambient room lighting by conventional means.

The two lights are electrically interconnected "in operative association therewith." (Column 1, lines 11-12).

It is apparent from the teaching of this patent that a ceiling mounted lighting fixture can serve multiple separate functions. It may usefully be employed over a hospital bed. In such an application, the spotlight can function as a reading light, with the fluorescent light providing ambient light. Certain ceiling fluorescent lights such as those described in the '129 patent may direct their maximum intensity at or around nadir. Such a fixture is illustrated in the Handbook of the Illuminating Engineering Society of North America, 8th edition, figure 9-34, "typical luminaire" no. 36. Exhibit E. It may be noted that if placed above a bed, and particularly if oriented parallel to an end wall, some light will fall on the end wall.

Other ceiling fluorescent lights are designed to cast their maximum intensity at higher angles from nadir, considering directions perpendicular to the lamp axis. Such a typical fixture also is illustrated in the Illuminating Engineering Society of North America Handbook, figure 9-34, "typical luminaire" no. 35. Exhibit E. From the polar intensity diagram immediately right of the fixture diagram, the maximum intensity in a plane perpendicular to the lamps is at roughly 35° from nadir. Such a light positioned reasonably close and parallel to an end wall will direct its maximum intensity onto the end wall. It will thereby create ambient lighting by reflection from the wall.

The '129 patent specifies that the spotlight is contained in an "outer shell" which attaches to the end of a fluorescent fixture. This is illustrated in figure 1 of the

patent as having a contour that in essence extends the fluorescent fixture by adding a matching compartment to house the spotlight. It will be obvious to a person of ordinary skill in the art that while the spotlight can be added as an extension of the fluorescent fixture in this way, the fluorescent fixture could alternatively simply be manufactured with this extension as part of its body, similarly providing the required space for the spotlight.

Specifically, the claim 1 of the '254 patent recites:

- "A medical lighting system

The '129 patent discloses a system of two lighting fixtures that can be usefully employed as a medical light.

- "A body ..

The '129 patent discloses the use of a body, which can house the spotlight only with a separate body for the fluorescent fixture, or through obviousness, a single body that houses the spotlight and the fluorescent fixture.

- "Means for ceiling-mounting said body."

The '129 patent discloses that it uses a "ceiling-type fixture"

- "a first light fixture within said body oriented to direct light downwardly to a selected reading area under said body ..."

The '129 patent provides a spotlight that can be directed to a selected reading area.

- "a second light fixture within said body oriented to direct light downwardly and outwardly to a vertical wall surface outwardly adjacent said body whereby light is reflected back to a broad area under said body."

If the limitation of claims 1 and 3 of the '254 patent concerning the second, or ambient, of this limitation is improperly construed to include any fixture that allows light to fall on an end wall, clearly the '129 patent allows such use.

Moreover, the '129 patent is not limited in terms of the type of fluorescent fixture or light distribution that it may produce. This is specifically stated: "However, it is to be noted that this invention is adaptable for use in association with any type of suspension or ceiling type fixture, the same being shown in the drawings by way of example only." Column 2, lines 10-13. It will be apparent to a person of ordinary skill in the art that the combination light can include a typical luminaire of the type 35 shown in the Illuminating Engineering Society of North America Handbook. Exhibit E. It will further be known by such a person that placing such

a luminaire near a wall will be an effective means of lighting that wall, as the maximum intensity will be aimed towards the wall.

It is apparent, therefore, that if the claim limitation regarding the second light is given its proper interpretation, whereby maximum light intensity is directed to an end wall, such an arrangement will be achieved by using a fixture constructed in accordance with the '129 patent, placed parallel and next to the wall, when the fluorescent portion of the fixture is of the conventional type 35 shown in the Illuminating Engineering Society of North America Handbook, or many others like it. The '129 patent therefore represents prior art to the '254 patent.

If the claim limitation regarding the second light is given a broader but improper limitation such that the light need not be directed towards an end wall but light merely falls upon the wall due to its proximity, then it is preceded by the '129 patent using virtually any available type of ambient light, such as the conventional type 36 shown in the referenced handbook.

- The '969 Patent. Exhibit D.

This patent discloses a wall-mounted version of an over-bed lighting fixture, for use over a patient's bed "and is used in hospitals, nursing homes and the like." Column 1, lines 42-43. It consists of a "single housing", column 1, line 40, within which are two forms of fluorescent lighting fixture. A third form of light optionally can be incorporated into the single housing.

One fluorescent fixture provides downward light through a conventional bottom mounted lens. The second fixture is adjustable and can be pivoted to illuminate different areas depending on its rotational orientation. The device can be rotated such that light is directed towards a patient's reading area, and "Thus, it may be directed to provide a patient reading lamp." Column 1, lines 52-53.

Although the '969 invention is described as wall-mounted, it will be apparent to a person of ordinary skill in the art that it can also be ceiling-mounted. All that is needed is a pair of L-shaped brackets to mount it to the ceiling while retaining its described orientation. The angular setting of the rotatable portion can readily be set while ceiling mounting the fixture so that the light is directed toward a reading area.

All claim elements of claim 1 of the '254 patent are either present or obvious in the '969 patent. It describes a medical lighting system that has a body. A means for ceiling mounting is obvious through the use of simple brackets. The first light fixture or reading light is provided by the rotatable light set to aim to the reading area, and it is included in the body. The second light fixture or ambient light for general illumination is provided and is also in the body.

The ambient light fixture is equipped with "a flat, horizontal, prismatic lens which directs illumination from one or more fluorescent tubes downward to illuminate the head of the bed." The Handbook of the Illuminating Engineering Society of North America, 8th edition, can be consulted to determine the light output from a fluorescent fixture that is equipped with a flat horizontal prismatic lens. Figure 9-34 of the handbook typical luminaire no. 45 shows a fluorescent fixture with a flat prismatic lens, as referred to in the '969 patent. Exhibit F. Observing the intensity polar diagram to the immediate right of the fixture sketch, it is apparent that this fixture has its maximum intensity (towards a parallel wall) that is roughly 40 degrees from nadir. Thus the highest intensity as such is aimed at an end wall.

If the teaching of the '969 patent is used with a different flat lens or diffuser, such as typical luminaire 41 in the Illuminating Engineering Society of North America handbook, maximum intensity is directed towards the bed beneath the fixture. Exhibit G.

My comments regarding invalidity regarding the second light are similar for the '969 patent as for the '129 patent above. The '254 patent, properly applied with regard to the second light is preceded by the '969 teaching using typical luminaire 45 of the Illuminating Engineering Society of North America handbook.

If the '254 claims 1 and 3 limitation regarding the second light is improperly interpreted as encompassing conventional fluorescent light distributions having maximum intensity at or near nadir, the '254 patent is clearly preceded by prior art, as evidenced by the '969 patent.

Ian Lewin

Ian Lewin Ph.D., FIES, L.C.
May 16, 2006

STATEMENT OF IAN LEWIN

EXHIBIT A

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Ian Lewin - Curriculum Vitae

Qualifications:

- B.S. Cum Laude, University of Newcastle, England 1964. Research thesis title: "A Study of the Glare Characteristics of Locomotive Headlights"
- Ph.D., Illuminating Engineering, University of Newcastle, England 1967. Thesis title: "A Study of the Factors Affecting Visual Performance under Industrial Lighting Conditions, with Particular Reference to Disability Glare and its Measurement"
- Lighting Certified, (LC), Qualified Professional

Positions held:

- 1998-present, President and CEO, Lighting Sciences, Inc., Scottsdale, Arizona
- 1979-98 President and Founder, Lighting Sciences Inc., Scottsdale, Arizona, USA, and Lighting Sciences Canada Ltd., Waterloo, Ontario, Canada
- 1984-92 Co-founder and Director. Lighting Sciences Australasia, Pty Ltd, Melbourne, Australia.
- 1973-79 Principal, Director and Co-founder, Environmental Research Laboratories, Scottsdale, Arizona
- 1967-73 Research Director, Holophane Co.

Memberships:

1. President, Illuminating Engineering Society of North America (IESNA). 1999-2000.
2. Member, Optical Society of America.
3. Member, American Institute of Physics.
4. Member, International Society for Optical Engineering, (SPIE).
5. Member of the U.S. National Committee of the International Commission on Illumination (CIE).
6. Member, Society of Automotive Engineers, (SAE), Lighting Standards Committee.
7. Chairman, Roadway Lighting Committee, Illuminating Engineering Society of North America (1994-96).
8. Chairman of the IESNA Board of Fellows, 1989-90.
9. Director, 1985-86, Illuminating Engineering Society.
10. Alternate Director for the United States, CIE Division 2, Measurement of Light and Radiation.

11. Member and past-chairman, Testing Procedures Committee of the IESNA.
12. Member of Standard Practice Subcommittee, Research Subcommittee, and Measurements and Calculations Subcommittee, Roadway Lighting Committee, IESNA.
13. Member and past-Chairman of the Lamp Spectral Effects Committee of IESNA.
14. Chairman of the Sign Lighting Subcommittee of the Roadway Lighting Committee of IESNA.
15. US representative to CIE Committee on "Photometry of Luminaires" Standard.
16. US representative to CIE Committee on "Lighting and Crime."

Honors/Awards

- Recipient of the 1997 Medal of the Illuminating Engineering Society of North America. (The society's highest honor for technical contributions).
- Louis B. Marks award of the Illuminating Engineering Society of North America. (The society's highest honor for non-technical contributions).
- Fellow of the IESNA.
- Recipient of the Distinguished Service Award of the IESNA.
- Man of the Year, 2001. Aerospace Lighting Institute.
- Honorary Life Member, Institution of Lighting Engineers, UK
- Invited keynote speaker, 25th quadrennial session of the CIE, "Light, Dark Skies and Space." San Diego, 2003.

Teaching Positions

- 1964-67 - Gateshead (UK) College of Technology. Instructor in Lighting Technology, intermediate and advanced courses.
- 1979-82 - Arizona State University. Faculty member, School of Architecture, Illuminating Engineering courses.
- 1967-present - Instructor in numerous courses sponsored by the Illuminating Engineering Society, the Electric League, and Edison Electric Institute.

Past-projects (as Project Director); 50 Examples

Research and Product Development.

1. Exterior lighting systems for NASA International Space Station: Development of multiple designs for outer space operation.
2. Development of FAA Advisory Circular for use of Light Emitting Diode (LED) devices on airport taxiways.
3. Research on the relationship between lamp color, safety and security
4. Modular Wallpack luminaire, refractor and mechanics. (Holophane Module 600)
5. High Intensity Discharge luminaire for highway signs. (Holophane Expresslight)
6. Light trespass research, (for Edison Electric Research Institute)
7. Space Shuttle Orbiter - optical systems for fluorescent and incandescent floodlights
8. Space Shuttle Orbiter – cockpit annunciator display control lenses
9. Development of a scene luminance photometer using digital photography
10. Dental lighting optical system for examination light
11. Roadway luminaire reflectors for cut-off luminaires. (Patented)

12. Parabolic louvers for interior lighting. (Patented)
13. Downlight lens and louvers for interior lighting. (Patented)
14. 3-E lens for high efficiency, widespread distribution interior lighting. (Patented)
15. Triumph I lens for discharge lamps, with high efficiency, widespread distribution. (Patented)
16. Wall mounted refractor/reflector optical system. (Patented)
17. Anti-reflection interference coatings for metal substrates. (Patented)
18. High reflection interference coatings for glass substrates. (Patented)
19. High efficiency aperture - type display signs.
20. High mast system reflector optics for highway interchange lighting
21. Indirect ambient lighting optical systems for offices. (3 Patents)
22. Underwater floodlighting systems for unmanned submarine surveillance, U.S. Navy.
23. Floodlight optics for sports lighting. (Hubbell Lighting)
24. Development of computerized mirror goniophotometer systems
25. Development of automated Spectroradiometer system for ultraviolet, visible and infrared measurements for Bureau of Radiological Health, US Food and Drug Administration
26. Variable reflector system for high intensity flashlights. ("Mag-lite")
27. Computerized design system for automotive headlights. (Sylvania)
28. Design of compression molding facility for lens prototypes
29. Hydroponic plant growth under artificial illumination. (General Mills)
30. Development of square distribution area lighting optics
31. Floodlight reflector design for 3 KW metal halide lamps for Open Pit Mining
32. Projection screen optics for large screen television
33. Sun tracking reflectors for reusable solar energy system
34. Aircraft lighting systems for Boeing 757 and 777 aircraft
35. Compliance testing program for automotive lighting devices. U.S. Dept. of Transportation, National Highway Safety Administration, 1985 - 1992
36. Optical system for surgical illumination. (American Sterilizer)
37. Research of traffic signal optical and electrical efficiency, Federal Highway Administration.
38. System of 480 moving mirrors under computer control for daylighting capture, Bank of Hong Kong and Shanghai
39. Development of traffic signals using Light Emitting Diodes (LED's)
40. Daylighting and building energy monitoring system for improved energy usage
41. Development of outdoor lighting optical controls for use in the vicinity of astronomical observatories
42. Design of tunnel lighting luminaire with asymmetric distribution
43. Research and development of a new navigational lighting system for ships, U.S. Navy
44. Development of airport lighting optics for runway delineation
45. Development of anti-collision warning system for aircraft
46. Development of computerized electrical test apparatus for luminaires and ballasts

47. Visibility research on battlefield decoys, U.S. Army, Fort Belvoir
48. Development of a self-leveling photometer for street lighting measurements
49. Design of landing and taxing lights for the F16 aircraft, U.S. Air Force
50. Research and development of a portable photometer to measure traffic signal performance, Federal Highway Administration. (Patented)

Technical Papers

Acronym list provided at end

1. *An Economic Study of Three Light Sources.* Paper to the IESNA Roadway Lighting Committee. Spring 2004. To be published.
2. *A Long and Winding Road. (The History of Street Lighting).* LD&A, December 2004.
3. *Roadway Lighting: An Investigation and Evaluation of Three Different Light Sources.* Final report to the Arizona Department of Transportation. May 2003.
4. *Lighting in Outer Space.* Proceedings of the 25th quadrennial session of the CIE. San Diego, June 2003.
5. *Lights that Circle the Earth.* LD&A Magazine, July 2003.
6. *Skylights as Luminaires: PIER Skylight Photometric Test Results.* Paper to the IESNA Annual Conference, August 2002.
7. *Lamp Color Influences Energy Usage and Night Safety.* Proceedings of the Intertech Conference on Energy Efficient Lighting, Tucson, Arizona 2002. Leukos JIES, January 2005.
8. *Photometric Test System for Skylights and Luminaires.* Leukos, JIES. January 2005.
9. *Towards an Understanding of Lamp Spectral Effects at Night.* Proceedings of the 2002 Conference of the IES of Australia and New Zealand, Sydney.
10. *White versus Sodium Light: The Newest Developments.* Proceeding of the ILE Annual Conference, Cardiff, Wales, 2002.
11. *Lamp Color Affects Visibility.* Luce magazine, Italy, 2001.
12. *Minimizing Light Trespass – Comparing Fixtures.* Electrical Contractor, July 2001.
13. *Light Trespass – What Does It Mean for Electrical Contractors?* Electrical Contractor, July 2000.
14. *Light Trespass – Research, Results and Recommendations.* Publication TM11 of the IESNA, New York, 2000.
15. *Light Trespass and Light Pollution – Practical Approaches to Dealing with the Problems.* Proceeding of the IESNA Street and Area Lighting Conference, 2000.
16. *Aspects of Recent American Research in Lighting Technology.* Proceedings of the Joint Conference of ILE and CIBSE, York, England, 2000.
17. *Lamp Color, Visibility, Safety and Security.* Seminar proceedings, Lightfair, May 2001
18. *IESNA Approved Method for the Photometric Testing of Fiber Optics Lighting Systems.* IESNA Publication no. LM-73-02.
19. *Lumen Effectiveness Multipliers for Outdoor Lighting Design.* Journal of the IESNA, Summer 2001

20. *Light Trespass Research.* Final Report to the Lighting Research Institute, 2000
21. *Metal Halide Lamps - A Technology Review.* Aerospace Lighting Institute Seminar, January 2000, Conference Proceedings
22. *Photometrics of Fiber Optic Systems.* Proceedings of Lightfair 2000, New York
23. *Should Vision Influence Roadway Lighting Design?* Better Roads Magazine, US Federal Highway Administration, October 1999
24. *Visibility Factors in Outdoor Lighting Design.* Institution of Lighting Engineers Conference Proceedings - Portsmouth, UK, 1999
25. *Accuracy of CCD (Digital Camera) Photometric Testing.* Council on Optical Radiation Measurement, 1999
26. *Development & Analysis of a Pedestrian Crossing Warning System.* Journal of the IESNA, Summer 2000
27. *Improved Luminaire Performance by Use of Reduced Envelope Metal Halide Lamps.* IESNA Conference, 1999
28. *Optical Component Relationships in the Design of Efficient Fiber Optic Illuminators.* Journal of the IESNA, Winter 2000.
29. *Road Scholar (The influence of lamp type on driver visibility at night).* LD&A Magazine, March 1999
30. *Photometric & Optical Methods of Lamp Analysis.* Society of Automotive Engineers (SAE) 1998. SAE transaction
31. *Lamp Spectral Effects at Roadway Lighting Levels.* The Lighting Journal (UK-ILE), 1999
32. *Luminaire Photometry Using Video Camera Techniques.* JIES, Winter 1999
33. *Advanced Techniques in Lamp Characterization.* International Society for Optical Engineering, (SPIE), Conference Proceedings, 1997
34. *Backlighting for Direct View & Projection Displays.* Information Display Magazine, Vol. 13. No. 11, November 1997
35. *Lighting On Three Continents.* CIE/SANCI international conference proceedings, South Africa, 1997
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CIE:	Commission Internationale de l'Eclairage (International Commission on Illumination)
IEEE:	Institution of Electrical and Electronics Engineers
IESNA:	Illuminating Engineering Society of North America
ILE:	Institution of Lighting Engineers (UK)
JIES:	Journal of the Illuminating Engineering Society of North America
LD&A:	Lighting Design and Application
NCHRP:	National Cooperative Highway Research Program
SAE:	Society of Automotive Engineers
SANCI:	South African National Conference on Illumination
SID:	Society for Information Display
SPIE:	International Society of Optical Engineering

List of Patents Held

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12. Forward throw optical system US patent no. 4,383,289
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18. Lens/Louver combination for interior lighting US patent no. 5,149,191
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20. Wall and ceiling lighting unit US patent no. 5,278,737
21. Improved floodlight reflector US patent no. 4,709,312
22. High efficiency specular louver US patent no. 4,059,754

Expert Witness Services

25 years of experience working for plaintiff and defense, including numerous depositions. State and federal court testimony.

Consulting, visibility reconstruction, light measurement, standards interpretation. Prior art research and patent validity analysis. Scientific and technical matters related to light, vision and lighting equipment.

Casework includes:

Traffic accidents: pedestrians, bicycles, automobiles, tractor-trailers

Trip and fall accidents

Assault and murder

Photography and visibility representation

Patent infringement

Restriction of trade

Breach of contract

References and details of recent casework available on request.

STATEMENT OF IAN LEWIN

EXHIBIT B

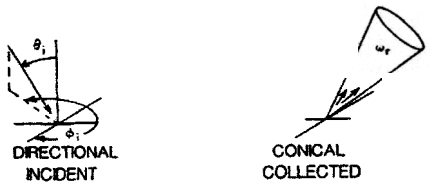
8TH EDITION

LIGHTING HANDBOOK

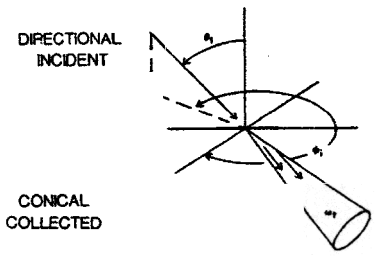
REFERENCE & APPLICATION

ILLUMINATING ENGINEERING SOCIETY
OF NORTH AMERICA

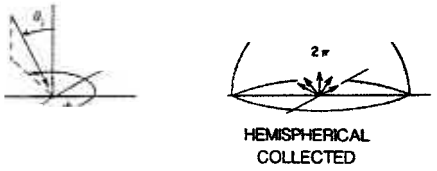
directional-conical reflectance, $\rho(\theta_i, \phi_i; \omega_r)$ the ratio of reflected flux collected through a conical solid angle to essentially collimated incident flux.
Note The direction of incidence must be specified, as must the direction and extent of the cone.



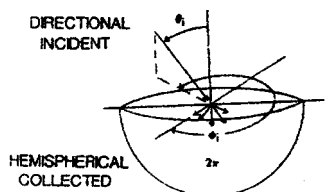
directional-conical transmittance, $\tau(\theta_i, \phi_i; \omega_r)$ the ratio of transmitted flux collected through a conical solid angle to essentially collimated incident flux.
Note The direction of incidence must be specified, as must the direction and extent of the cone.



directional-hemispherical reflectance, $\rho(\theta_i, \phi_i; 2\pi)$ the ratio of reflected flux collected over the entire hemisphere to essentially collimated incident flux.
Note The direction of incidence must be specified.



directional-hemispherical transmittance, $\tau(\theta_i, \phi_i; 2\pi)$ the ratio of transmitted flux collected over the entire hemisphere to essentially collimated incident flux.
Note The direction of incidence must be specified.



directional lighting lighting provided on the workplane or on an object predominantly from a preferred direction. See *accent lighting*, *key light* and *cross light*.

disability glare the effect of stray light in the eye whereby visibility and visual performance are reduced. A direct glare source that produces discomfort may also produce disability glare by introducing a measurable amount of stray light in the eye.

disability glare factor (DGF) a measure of the visibility of a task in a given lighting installation in comparison with its visibility under reference lighting conditions, expressed in terms of the ratio of luminance contrasts having an equivalent effect upon task visibility. The definition of the DGF takes account of the equivalent veiling luminance produced in the eye by the pattern of luminances in the task surround.

discomfort glare glare producing discomfort. It does not necessarily interfere with visual performance or visibility.

discomfort glare factor the numerical assessment of the capacity of a single source of brightness, such as a luminaire, in a given visual environment for producing discomfort (this term is obsolete and is retained only for reference and literature searches). See *glare* and *discomfort glare*.

discomfort glare rating (DGR) a numerical assessment of the capacity of a number of sources of luminance, such as luminaires, in a given visual environment for producing discomfort. It is the net effect of the individual values of the index of sensation for all luminous areas in the field of view. See *discomfort glare factor*. See also chapter 9, Lighting Calculations.

distal stimuli any of the points, lines and surfaces and three-dimensional arrays of scattering particles which one can identify in the physical space in front of the eye and which form optical images on the retina. Each element of a surface or volume to which an eye is exposed subtends a solid angle at the entrance pupil. Such elements of solid angle make up the field of view, and each has a specifiable luminance and chromaticity. Points and lines are specific cases which have to be dealt with in terms of total intensity and intensity per unit length.

distribution temperature (of a light source) the absolute temperature of a blackbody whose relative spectral distribution is most nearly the same in the visible region of the spectrum as that of the light source.

dominant wavelength (of a light), λ_d the wavelength of radiant energy of a single frequency that, when combined in suitable proportion with the radiant energy of a reference standard, matches the color of the light. See *complementary wavelength*.

downlight a small direct lighting unit which directs the light downward and can be recessed, surface mounted or suspended.

downward component that portion of the luminous flux from a luminaire emitted at angles below the horizontal. See *upward component*.

driving beam See *upper (driving) beams*.

dual headlighting system headlighting by means of two double units, one mounted on each side of the front end of a vehicle. Each unit consists of two sealed beam lamps mounted in a single housing. The upper or outer lamps may have two filaments supplying the lower beam and part of the upper beam, respectively. The lower or inner lamps have one filament providing the primary source of light for the upper beam.

GLOSSARY OF LIGHTING TERMINOLOGY 939

solid angles. These concepts must be applied with care if the area of the transmitting element is not large compared to its thickness, in view of internal transmission across the boundary of the area. For many geometrically specified transmittance properties it is assumed that the radiance (luminance) is isotropic over the specified solid angle of incidence. Otherwise, the property is a function of the directional distribution of incident radiance (luminance) as well as the beam geometry and the character of the transmitting surfaces or media. Most transmittance quantities are applicable only to the transmittance of thin films with negligible internal scattering, so that the transmitted radiation emerges from a point that is not significantly separated from the point of incidence of the incident ray that produces the transmitted ray or rays. The governing considerations are similar to those for application of the bidirectional reflectance distribution function (BRDF), rather than the bidirectional scattering-surface reflectance distribution function (BSSRDF).

transverse roadway line (TRL) any line across a roadway that is perpendicular to the curb line.

tristimulus values of a light, X, Y, Z the amounts of each of three specific primaries required to match the color of the light.

troffer a recessed lighting unit, usually long and installed with the opening flush with the ceiling. The term is derived from "trough" and "coffer."

troland a unit of retinal illuminance which is based upon the fact that retinal illuminance is proportional to the product of the luminance of the distal stimulus and the area of entrance pupil. One troland is the retinal illuminance produced when the luminance of the distal stimulus is 1 cd/m^2 and the area of the pupil is 1 mm^2.

Note The troland makes no allowance for interocular attenuation or for the Stiles-Crawford effect.

tube See *lamp*.

tungsten-halogen lamp a gas-filled tungsten incandescent lamp containing a certain proportion of halogens in an inert gas whose pressure exceeds 3 atm.

Note The tungsten-iodine lamp (U.K.) and quartz iodine lamp (U.S.) belong to this category.

turn signal operating unit that part of a signal system by which the operator of a vehicle indicates the direction a turn will be made, usually by a flashing light.

U

ultraviolet lamp a lamp which radiates a significant portion of its radiative power in the ultraviolet (UV) part of the spectrum; the visible radiation is not of principal interest.

ultraviolet radiation for practical purposes any radiant energy within the wavelength range 10–380 nm. See *regions of the electromagnetic spectrum*.

Note On the basis of practical applications and the effect obtained, the ultraviolet region often is divided into the following bands:

Ozone-producing	180–220 nm
Bactericidal (germicidal)	220–300 nm
Erythemal	280–320 nm
"Black light"	320–400 nm

There are no sharp demarcations between these bands, the indicated effects usually being produced to a lesser extent by longer and shorter wavelengths. For engineering purposes, the "black light" region extends slightly into the visible portion of the spectrum. Another division of the ultraviolet spectrum often used by photobiologists is given by the CIE:

UV-A	315–400 nm
UV-B	280–315 nm
UV-C	100–280 nm

units of luminance† the luminance of a surface in a specified direction may be expressed as luminous intensity per unit of projected area of surface or as luminous flux per unit of solid angle and per unit of projected surface area.

Note Typical units are the cd/m^2 [lm/(sr · m^2)] and the cd/ft^2 [lm/(sr · ft^2)]. The luminance of a surface in a specified direction is also expressed (incorrectly) in lambertian units as the number of lumens per unit area that would leave the surface *if the luminance in all directions within the hemisphere on the side of the surface being considered were the same as the luminance in the specified direction*. A typical unit in this system is the footlambert (fL), equal to 1 lm/ft^2. This method of specifying luminance is equivalent to stating the number of lumens that would leave the surface *if the surface were replaced by a perfectly diffusing surface with a luminance in all directions within the hemisphere equal to the luminance of the actual surface in the direction specified*. In practice no surface follows exactly the cosine formula of emission or reflection; hence the luminance is not uniform, but varies with the angle from which it is viewed. For this reason, this practice is denigrated.

unrecoverable light loss factors See *nonrecoverable light loss factors*.

upper (driving) beams one or more beams intended for distant illumination and for use on the open highway when not meeting other vehicles. Formerly "country beams." See *lower (passing) beams*.

upward component that portion of the luminous flux from a luminaire emitted at angles above the horizontal. See *downward component*.

utilance See *room utilization factor*.

V

vacuum lamp an incandescent lamp in which the filament operates in an evacuated bulb.

valance a longitudinal shielding member mounted across the top of a window or along a wall and usually parallel to the wall, to conceal light sources giving both upward and downward distributions.

valance lighting lighting comprising light sources shielded by a panel parallel to the wall at the top of a window.

values of spectral luminous efficiency for photopic vision, V(l) values for spectral luminous efficiency at 10-nm intervals (see chapter 1, Light and Optics) were provisionally adopted by the CIE in 1924 and were adopted in 1933 by the International Committee on Weights and Measures as a basis for the establishment of photometric standards of types of sources differing from the primary standard in

STATEMENT OF IAN LEWIN

EXHIBIT C

June 19, 1951 N. J. McDAID 2,557,129

SPOTLIGHTING UNIT

Filed June 1, 1948

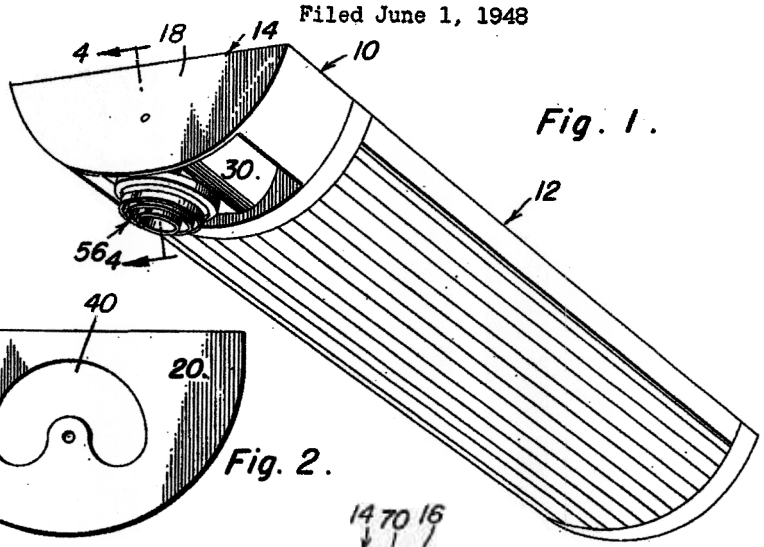


Fig. 1.

Fig. 2.

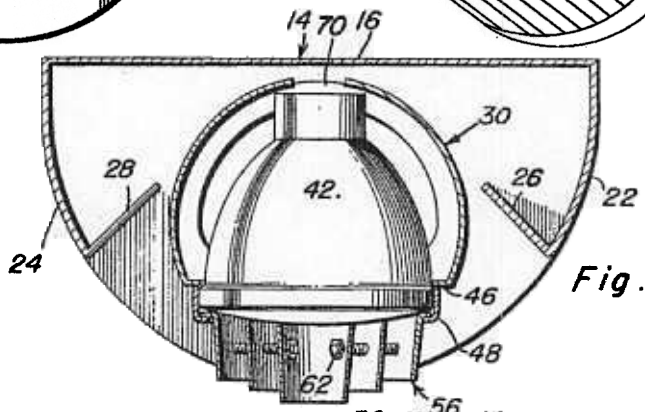


Fig. 3.

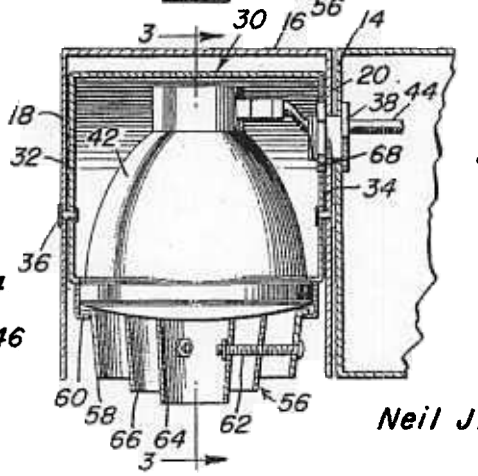
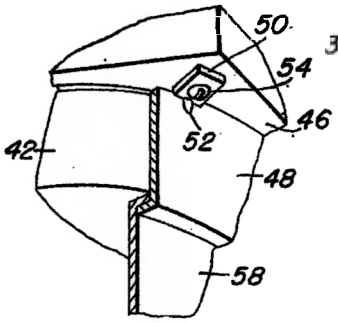


Fig. 4.

Fig. 5.



Neil J. McDaid
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Patented June 19, 1951

2,557,129

UNITED STATES PATENT OFFICE

2,557,129

SPOT LIGHTING UNIT

Neil J. McDaid, Charleston, S. C., assignor of ten per cent to Toole-Woodward Engineering Company, Charleston, S. C.

Application June 1, 1948, Serial No. 30,492

1 Claim. (Cl. 240—78)

1

This invention relates generally to new and useful improvements in spotlighting fixtures and has for its primary object to provide a novel and compact spotlighting fixture, which is adapted for attachment to a suspension or ceiling type fixture.

Another important object of this invention is to provide a spotlighting fixture for use in association with a ceiling type fixture, the spotlighting fixture being easily and conveniently installed on the ceiling type fixture, in operative association therewith.

Another object of this invention is to provide a spotlight unit, which is adapted for attachment to a suspension or ceiling type fixture and which is pivotally installed thereon, so as to be adjustable and to project its beam in various selected directions.

A meritorious feature of this invention resides in the provision of a pivotally mounted spotlighting fixture, which is pivotally installed on a ceiling type fixture, so that the spotlight can be readily and easily focussed in any desired direction from the floor by any suitable long instrument.

Another meritorious feature of this invention resides in the provision of an outer shell, which is rigidly secured to one end of a fluorescent luminary or to any type of suspension type fixture and which is adapted to pivotally house an inner shell, the inner shell serving to support a lamp.

Another important feature of this invention resides in the provision of means for mounting the outer shell to the end of a fluorescent luminary or the like suspension type fixture, the securing or mounting means serving as a communicating means for wiring a spotlight in the main light or fixture circuit.

These and ancillary objects and other meritorious features are attained by this invention, a preferred embodiment of which is set forth in the following description and illustrated in the accompanying drawings, wherein:

Figure 1 is a view in perspective of a fluorescent luminary, showing this invention in operative attachment thereto;

Figure 2 is a side elevational view of one side of the outer shell;

Figure 3 is a vertical longitudinal sectional view of this invention as taken substantially along the plane of line 3—3 in Figure 4;

Figure 4 is a vertical transverse sectional view of this invention as taken substantially along the plane of line 4—4 in Figure 1, and

2

Figure 5 is an enlarged fragmentary view of the means provided for attaching a lamp supporting ring to the inner shell.

Referring now more particularly to the drawings, wherein similar characters of reference designate corresponding parts throughout, this invention, generally designated by the character reference 10, is shown in operative attachment with a conventional fluorescent luminary 12. However, it is to be noted that this invention is adaptable for use in association with any type of suspension or ceiling type fixture, the same being shown in the drawings by way of example only.

The fluorescent luminary 12 has a pair of opposed depending arcuate ends 14, to which this invention may be easily attached, either on one or both ends, as desired. The semi-circular end caps 14 of the fluorescent luminaries may be utilized, depending upon the spotlighting requirements of the establishment. In the case where only one unit is attached, the unsummetrical effect of the added unit will not be easily noticed, due to the small over-all length of the spotlighting unit 10, as compared to the large length of the fluorescent luminary.

This invention comprises an outer shell 14, having a rectangular top 16 and semi-circular or arcuate end caps 18 and 20, which depend therefrom. Opposed arcuately inturned end sections 22 and 24 terminate in upwardly extending baffles 26 and 28. Pivotally mounted within the outer shell 14 is an inner shell 30. The inner shell 30 is of a substantially similar shape, having opposed arcuate sides 32 and 34. The sides 32 and 34 are riveted to the sides 18 and 20 of the outer shell, as at 36. However, it is to be apparent that similar or other pivotal attaching means may be employed for securing the two shells together, so that the inner shell is capable of defining an arcuate path of travel within the outer shell, the outer shell being rigidly attached to the fluorescent luminary or ceiling fixture. Suitable means may be provided for securing the spotlighting unit 10 to the end cap 14 of the fluorescent luminary and comprises a nipple 38, which rigidly secures the end cap 20 to the end of the luminary, the nipple being inserted in a knockout area 40. However, an arcuate slot or guide-way 68 is formed in the side 34 of the inner shell, the projected end of the nipple travelling within the slot or guide-way 68.

Means is provided for mounting a conventional lamp 42 within the inner shell, the lamp 42 being wired in the circuit of the fluorescent luminary through the medium of a lead wire 44. The

conducting or lead wire 44 extends through the nipple 38, as shown in Figure 4 of the drawings. The means preferred for mounting the lamp comprises the formation of a circular opening in the substantially flat bottom portion of the inner shell 30, the opening defining an inwardly directed flange 46 on the bottom of the inner shell. A lamp supporting ring 48 is suitably secured to the flange 46 of the inner shell by any suitable securing or attachment means. By way of example, an angle clip 50 has one side 52 welded to the ring 48, the opposite side of the angle clip having an attaching aperture 54. Metal screws are employed in association with the attaching apertures 54 and suitable apertures formed in the flange 46 to secure the clip to the inner shell.

A plurality of nested louvres 56 are carried by the supporting ring 48 and disposed in vertical alignment with the seated lens face of the lamp 42. The outer louvre 58 has an attaching flange 60, which is seated on the inwardly directed flanged end of the lamp supporting ring 48. Suitable securing means 62 is provided to attach the circular inner nested louvres 66 and 64 to the outer supporting louvre 58, as shown more particularly in Figures 3 and 4 of the drawings.

Thus, it can be seen that the inner shell 30 is free to turn forty-five degrees, right or left, on a horizontal axis. Suitable control means for accomplishing the adjustment of the beam direction may be employed and preferably, would be employed by a person from a floor supported position. A stick or pole or similar instrument may be employed to exert pressure on one side of the inner shell, until the desired angle is obtained. No mechanical stop or locking device is required to hold the lamp at the desired angle, as the center of gravity pivot of the inner shell enables the entire inner assembly to be swung back and forth very easily and conveniently, the construction requiring but a bare minimum of tension in order to remain in the position it is placed.

In order to allow the heat emanating from the lamp to be exhausted into the outer shell, an opening 70 is formed in the top portion of the inner shell defining a communicating passage between the inner and outer shell.

Thus, it can be appreciated that there has been provided a compact and efficient attachment for a suspension type fixture, of fluorescent or other structure, which can be easily and conveniently adjusted from a floor position and which, in such adjustment, will remain fixed in the adjusted position.

However, since many other purposes and objects of this invention will become apparent to those skilled in the art, upon a perusal of the foregoing description, in view of the accompanying drawings, it is to be understood that certain changes may be effected thereon, as coming within the spirit of the invention and the scope of the appended claim.

Having described the invention what is claimed as new is:

A spotlight fixture adapted for attachment to a ceiling light fixture comprising an outer shell, said outer shell including a rectangular top plate, extending opposed arcuate sides and arcuately inturned ends, an inner shell, of similar shape pivotally mounted to the sides of the outer shell, baffles formed on the ends of the outer shell and projecting upwardly between the shells, a circular ring secured to the open end of the inner shell, a lamp disposed within the inner shell and having a lens face seated on the ring, nested louvres suspended from the ring in vertical alignment with the lens face of the lamp, aligned openings in one of the sides of the shells, means disposed in the openings for attaching the shells to a ceiling light fixture, said inner shell being movable about the attaching means and an opening in the inner shell for exhausting heat into the outer shell.

NEIL J. McDAID.

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2,313,131	Elias	Mar. 9, 1943

STATEMENT OF IAN LEWIN

EXHIBIT D

United States Patent [19]

Miller

[11] **Patent Number: 4,816,969**

[45] **Date of Patent: Mar. 28, 1989**

[54] **WALL-MOUNTED OVER-BED LIGHTING FIXTURE**

[75] Inventor: **David H. Miller**, Walnut Creek, Calif.

[73] Assignee: **Hospital Systems Inc.**, Oakland, Calif.

[21] Appl. No.: 149,473

[22] Filed: Feb. 5, 1988

[51] Int. Cl.[4] A47B 23/06

[52] U.S. Cl. 362/130; 362/801; 362/282; 362/287; 362/394

[58] Field of Search 362/130, 147, 223, 224, 362/225, 217, 234, 244, 245, 260, 277, 282, 283, 319, 322, 285, 287, 801, 35, 455, 394, 269, 275; 128/23

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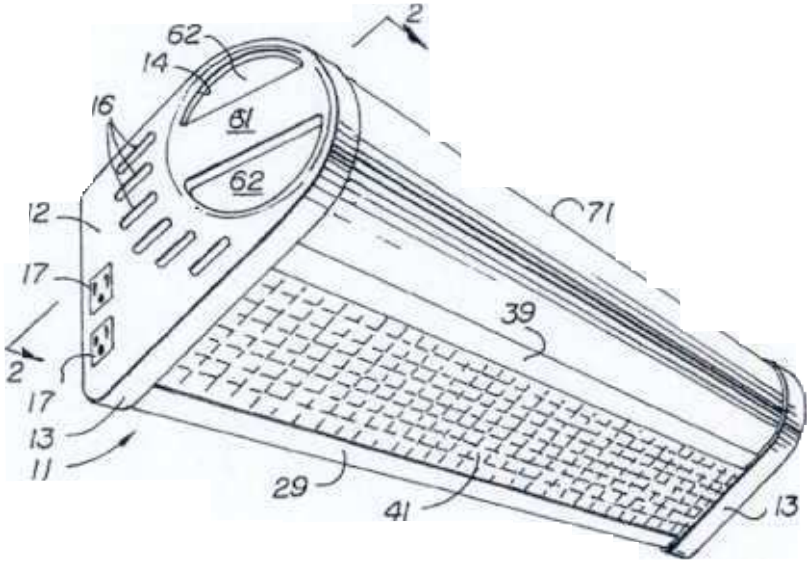
Primary Examiner—Michael Koczo
Assistant Examiner—D. M. Cox
Attorney, Agent, or Firm—Julian Caplan

[57] **ABSTRACT**

The housing for the fixture is mounted on a wall over the patient's bed. The housing accommodates a first non-rotatable fixture which directs light from fluorescent tubes downward through a conventional flat prismatic lens. There is also a longitudinally extending lens mounted within the outline of the housing and rotatable by means of handles at either end so that light from a second set of fluorescent tubes may be adjusted to function as a reading lamp for the patient, as an examining light at different locations of the patient's body and as a room illumination source, the intensity of room illumination being adjustable. A safety switch is moved to "off" position when the housing is struck by an object such as an IV rod fixed to an adjustable bed to stop the motor which moves the bed.

11 Claims, 3 Drawing Sheets



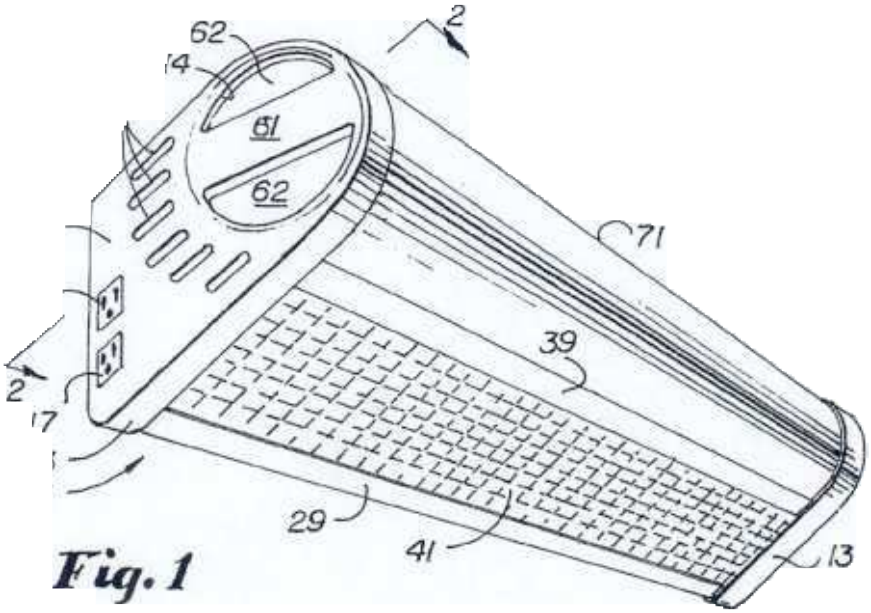


Fig. 1

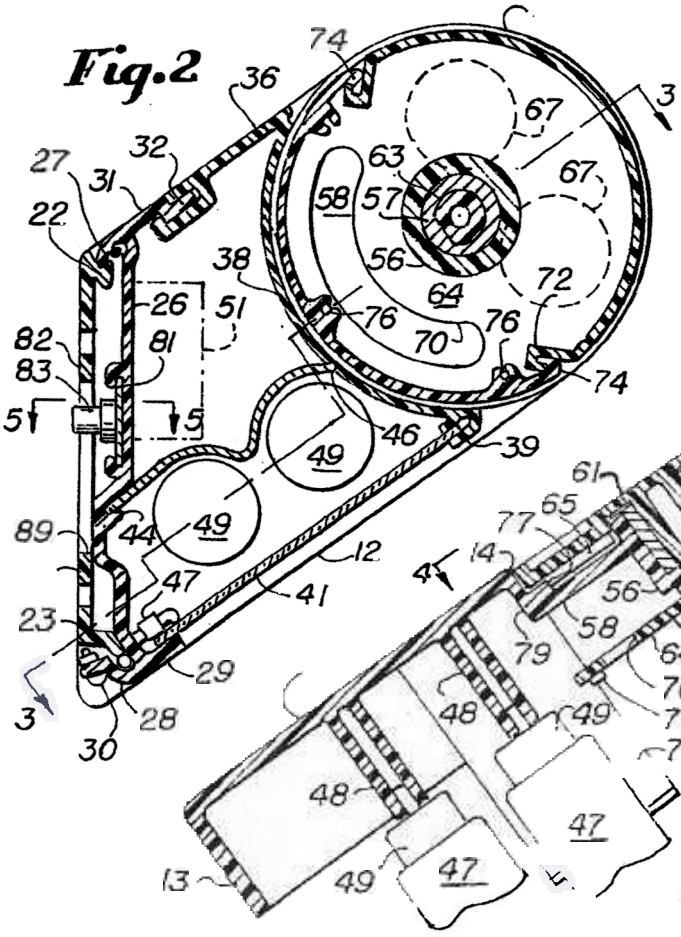


Fig.2

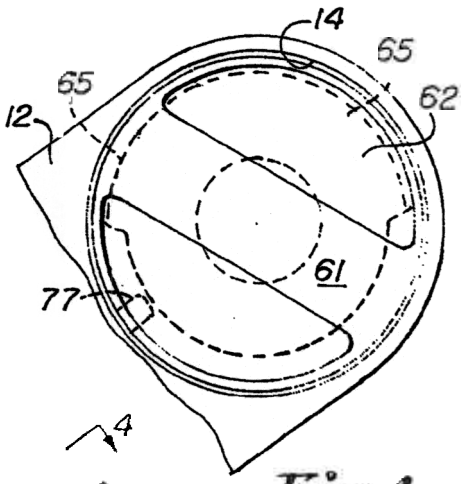


Fig.4

Fig. 3

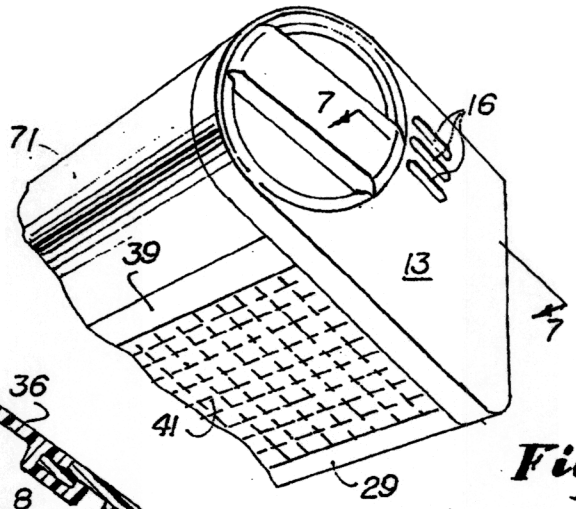


Fig.6

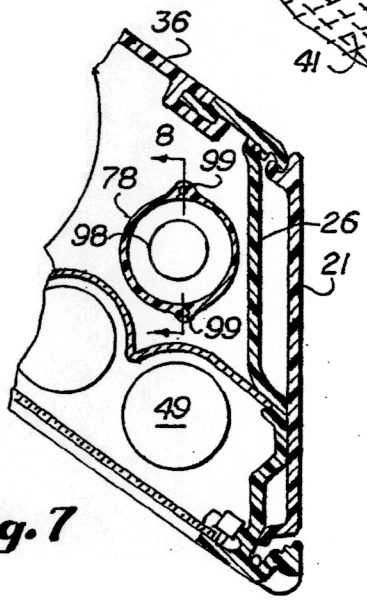


Fig.7

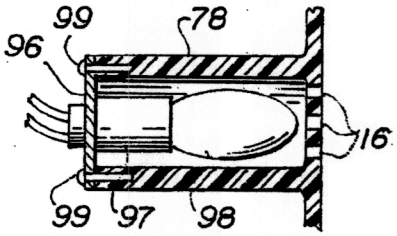


Fig.8

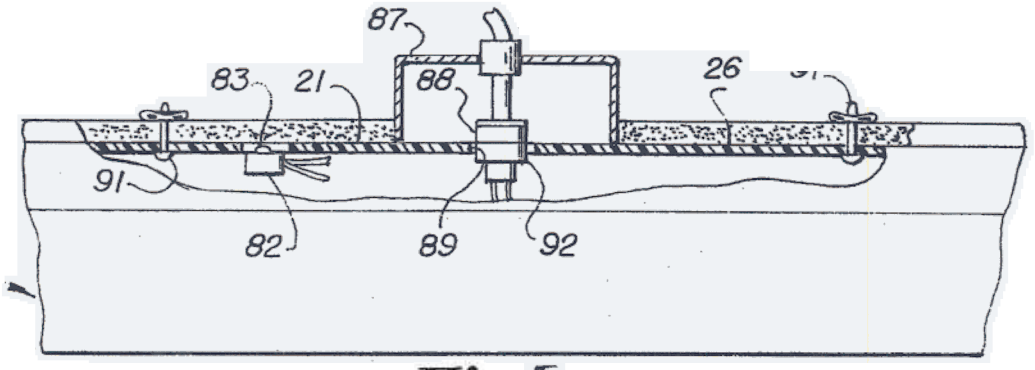


Fig.5

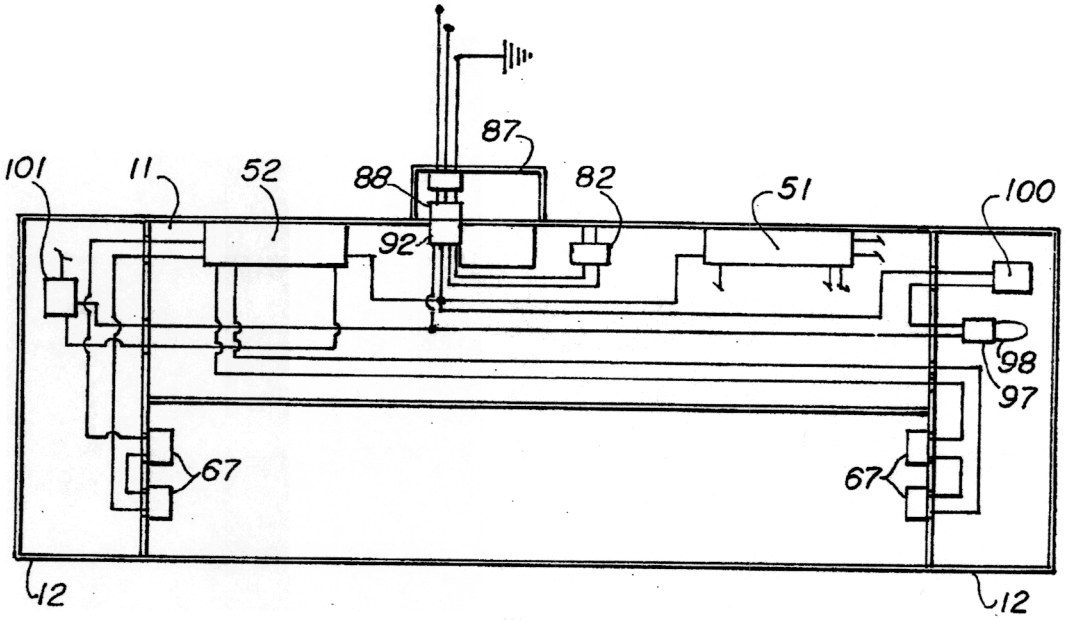

101
11
52
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Fig.9

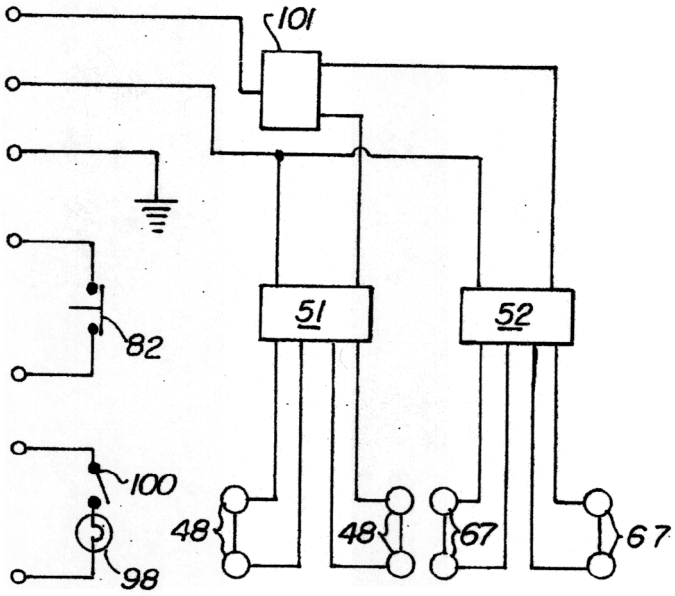
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Fig.10

WALL-MOUNTED OVER-BED LIGHTING FIXTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a wall-mounted over-bed hospital lighting fixture of the type which provides illumination of the head of the bed and is characterized by the provision of a rotatable lamp incorporated in the housing of the device which may be used as a patient reading lamp, as a physician's examining lamp and also as a variable room illumination lamp.

2. Description of Related Art

Wall-mounted bed lighting fixtures are well known in the art. Such fixtures generally have a horizontal flat prismatic lens through which illumination from the interior of the housing is directed to the head of the bed which is mounted immediately therebeneath. The provision of patient examining lights and reading lamps which are mounted on the wall is also well known.

The present invention differs from prior fixtures in that both lighting fixtures are totally enclosed within a wall-mounted housing.

U.S. Pat. No. 3,919,540 discloses a safety light with a switch responsive to interfering movement of an IV rod, or the like, which interrupts power to a bed-elevating motor. U.S. Pat. No. 4,149,222 shows a pivotal wall mounting for a bed light wherein the fixture is hinged to a mounting plate with a leaf hinge. The present invention provides an improved pivotal mounting which does not require a leaf hinge and is more easily installed than prior fixtures of this type. A room may be completely finished and painted before the fixture is set into place, preventing damage to the paint or to the fixture. The bracket then serves as an integral part of the safety interlock.

SUMMARY OF THE INVENTION

A single housing preferably formed of interfitting extrusions is provided which is mounted extending longitudinally horizontally on the wall above a bed and is used in hospitals, nursing homes and the like. On the bottom of the housing is a flat, horizontal, prismatic lens which directs illumination from one or more fluorescent tubes downward to illuminate the head of the bed.

Also mounted on the upper portion of the housing is a rotatable two-part cylinder, one part being transparent and the other opaque and within the cylinder are one or more additional fluorescent lamps. By turning a handle at either end of the housing, the cylindrical member may be directed in various positions. Thus, it may be directed to provide a patient reading lamp. It may also be adjusted so that it illuminates any portion of the bed and may be used by a physician or nurse as an examining lamp. Additionally, the transparent portion of the lamp may be directed toward the ceiling or any portion of the room to provide room illumination. Particularly in connection with the latter function, the amount of illumination may be controlled by exposing or concealing within the housing varying portions of the transparent part of the rotatable member.

The housing may also contain a night light which shines through louvers in the end cap of the housing.

Another feature of the invention is the fact that all of the rotatable elements including the handles which turn the rotatable member are at all times within the outline of the housing so that in none of its various positions of adjustment does the lamp extend outside the outline of the housing.

An advantage of the invention is the fact that, regardless of the position of adjustment of the rotatable lamp, it is always within the confines of the housing, thereby differing from those overhead reading lamps which are hinged or pivotted to the housing and in down position extend outside the housing.

Another advantage of the invention is that all wires for all lamps are contained within the housing and do not extend exteriorly thereof.

A still further feature of the invention is the provision of a safety interface comprising a switch which cuts off power to an adjustable bed or the like in the event that the bed or an upward-extending member attached to a bed comes in contact with the lighting fixture This safety feature prevents the hospital bed from being torn off the wall if it is wall-mounted and prevents damage to the housing of the fixture The mounting of the fixture to a plate attached to the wall is an improved feature of this invention.

FIGURES IN THE DRAWINGS

FIG. 1 is a perspective view of a fixture in accordance with the present invention.

FIG. 2 is a sectional view taken substantially along the line 2—2 of FIG. 1.

FIG. 3 is a sectional view taken substantially along the line 3—3 of FIG. 2.

FIG. 4 is a fragmentary enlarged end elevation as vised from the right of FIG. 3.

FIG. 5 is a fragmentary plan view showing the fixture mounted on a wall.

FIG. 6 is a perspective view of a portion of the device.

FIG. 7 is a fragmentary sectional view taken substantially along the line 7—7 of FIG. 6.

FIG. 8 is a sectional view along line 8—8 of FIG. 7.

FIG. 9 is a schematic wiring layout of electrical portions of the invention. FIG. 10 is a schemtic wiring diagram of the same.

DESCRIPTION OF PREFERRED EMBODIMENT

Housing 11 has end caps 12 at either end, each end cap 12 having an inward projecting relatively narrow rim 13. A circular hole 14 is formed in each end cap as are louvers 16. Sockets 17 may be recessed into the end caps for attachment of various appliances as desired.

Mounted within the housing 11 and within the confines of the end caps 12 is a longitudinally extending mounting bracket 21 which is fixed to a wall so that the housing 11 extends horizontally longitudinally above the bed. Wall 86 has a conventional junction box 87 recessed therein and extending outward therefrom is a first snap connector member 88. Bracket 21 has a knock-out hole 89 formed therein fitting over junction box 87. Bracket 21 is attached to wall 86 by screws 91. Along the top edge bracket 21 is a top interlock receptor 22 and along the bottom edge is a bottom interlock lug 23. Interfitting with bracket 21 is a longitudinally extending rear member 26 which has a top lug 27 received in receptor 22 and a bottom receptor 28 which receives bottom lug 23 in such manner that when an object such as an IV rod attached to a hospital bed strikes housing 11, rear member 21 pivots upward. Along the bottom of member 26 is an external flange 29 and along the top is a top flange 31 which is formed at

its outer end with an internally offset lug 32. Screws 30 recessed in the lower part of the fixture are tightened to an extent to allow pivoting of top lug 27 on receptor 22 but still contain relative movement to prevent housing 11 from coming away from wall 86. Second snap connector member 92 mates with connector 88 when the members are assembled to supply power to the fixture.

Top member 36 has a top receptor 37 which receives lug 32 so that the members 31 and 26 comprise essentially a unit. Preferably top member 36 extends at an obtuse angle relative to member 21 and at its forward end is formed in an arcuate portion 38. The lower end of arcuate portion 38 comprises a bottom receptor 39. Mounted on the bottom of the housing is a flat prismatic lens 41 which is disposed approximately parallel to the top member 36. The upper end or outer edge of lens 41 is received in receptor 39 and its lower or inner edge is held by an edge clamp 42 connected to external flange 29 of rear member 26. The lens 41 may be removed by release of clamp 42. Above lens 41 is a reflector 43 the edges of which are received in receptors 44 and 46 in rear member 26 and arcuate portion 38, respectively. Fluorescent tubes 47 are held in place by inward extensions 4 end caps 12, the sockets 49 for the tubes 47 in threaded engagement with the hollow extensions 48. It will be understood that the shape of reflector 43 is such as to direct the illumination from the tubes 47 outward through the lens 41. Ballast 51 for tubes 47, shown schematically in FIG. 2, is mounted in the space above the reflectors 43. Various lengths of housing 11 may be used and the proper length tube 47 is chosen for a particular length housing.

Concentric with the center of curvature of arcuate portion 38 is a bearing hub 56 which is integral with end cap 12 and is connected to the end portion thereof by a web 58 and to the upper rim portion 13 thereof by web 59. Within the hub 56 is sleeve bearing 57. It will be noted that the webs 58 and 59 are recessed and fitting within the recess is a rotation handle or knob 61 formed with depressions 62 so that it may be conveniently gripped by a physician, nurse or other attendant to turn the handle 61. Fitting through sleeve bearing 57 is a hollow stem 63 which is an inward extension of handle 61. The inner end of stem 63 is formed non-circular with a flat 69 (see FIG. 4) and is received within an appropriate hole in mounting disk 64. A retaining ring 66 secures the stem 63 and disk 64 together. Attached to disk 64 are one or more sockets 67 to receive fluorescent tubes 68, preferably of the same length as tubes 47. A slot 70 here shown to be arcuate is formed in disk 64 for passage of wiring from the ballast 52 to the sockets 67. Ballast 52 is likewise within housing 11.

A transparent substantially semi-cylindrical rotatable lens 71 is provided having receptors 72 at either edge. Interfitting with lens 71 is a rotatable lens mounting 73 having at either edge lugs 74 which fit into the receptors 72. The members 71 and 73 comprise a cylindrical longitudinally extending member and attachment ears 76 are used to secure the mounting 73 to the disks 64. Arcuate portion 38, handle 61, stem 63, disk 64, lens 71, and lens mounting 73 all have a common center of curvature.

Stops 77 are inserted in wall 79 of opening 14 in cap 12. Handle 61 has a projection 65 which intersects stops 77 and limit the oscillatory movement of lens 71 to less than 360°.

One feature of the invention is the fact that the parts may largely be formed of aluminum alloy extrusions, thereby making the cost of construction relatively inexpensive.

A safety feature of the invention is the provision of a switch which may be opened if a hospital bed or the orthopedic frame above such a bed or an IV rod attached to the bed comes in contact with the fixture. Thus a mounting plate 81 is installed in a suitable socket in the rear member 26. A switch button 83 bears against the mounting bracket 21. If, due to distortion of the housing 11 by reason of contact with a bed or frame above a bed, the button 83 is pressed inward to open the circuit. Switch 82 may be used to discontinue power to the bed operating motor, to sound an alarm or for other purposes.

The fluorescent tubes 47 which provide illumination through the lens 41 illuminate the head of the bed in normal fashion. However, by rotating the handle 61, the transparent rotatable lens 71 may be adjusted in position so that it shines down to provide a reading lamp for the patient or may be turned so that it illuminates any portion of the patient's body for purpose of examination. The lens 71 may be turned upward so that indirect illumination of the room is provided and the degree of such illumination may be adjusted by the relative proportions of the transparent lens 71 and opaque mounting 73 which are exposed outside the arcuate portion 38.

For night-light purposes, a sub housing 78 is formed in end cap 12 adjacent louvers 16. A mounting plate 96 carries socket 97 for lamp 88. Plate 96 is attached to the inner open end of sub-housing 78 by screws 99. Light from lamp 98 shines out through louvers 16.

As previously stated, all wiring is confined within the housing 11. The wiring diagram for the fluorescent lamps 47 and 68 and for switch 82 is shown in FIG. 10. FIG. 9 shows schematically how the wiring and ballasts 51, 52 are disposed within the housing. A four-position switch 101 controls current entering the system from connector 92 to ballasts 51 and 52 for lamps 47 and 68, respectively, so that either set of lamps or both or neither may be illuminated by adjustment of switch 101, which is accessible from the exterior through an opening (not shown) in one of end caps 12. A toggle switch 100, also accessible from the exterior, controls night lamp 98.

What is claimed is:

1. An over-bed hospital lighting fixture comprising a longitudinally disposed housing having mounting means for mounting said housing on a wall,

end caps on either end of said housing formed with aligned circular openings,

a cylindrically arcuate member positioned in said housing outward of said mounting means and transverse to said end caps having its center of curvature substantially co-extensive with the center of curvature of said circular openings and disposed longitudinally of said housing,

a substantially semi-cylindrical, substantially opaque lens mounting rotatable about an axis concentric with said center of curvature and having first connecting means along its longitudinal edges,

a substantially semi-cylindrical, transparent lens with its axis substantially co-extensive with said center of curvature and having second connecting means along its longitudinal edges cooperable with said first connecting means to combine said lens mounting and said lens as a cylindrical unit,

a pair of mounting disks connected adjacent either end of said housing for rotation with said cylindri-

cal unit and having light sockets to receive light bulbs,

a handle at at least one end of said housing having a shaft passing through said circular opening and connected for rotation with said lens mounting, said lens and said mounting disk,

whereby by turning said handle the relative amount of light passing out of said housing through said lens may be adjusted.

2. A fixture according to claim 1 which further comprises a flat transparent bottom wall for said housing interposed between said mounting means and said arcuate member, a reflector inward of said bottom wall, lighting means between said reflector and said bottom wall and means for mounting said bottom wall, said reflector and said lighting means in said housing.

3. A fixture according to claim 2 in which said bottom wall comprises a substantially rectangular prismatic lens.

4. A fixture according to claim 3 in which said lighting means comprises longitudinally disposed fluorescent tubes.

5. A fixture according to claim 1 which further comprises a fluorescent tube longitudinally disposed in said housing having its opposite ends received in said sockets of said disks.

6. A fixture according to claim 1 in which each said end cap is formed with an indented annular web having a bearing housing concentric with said axis, said handle being recessed in said annular web, said handle having a stem passing through said web and connected inside said web to one said disk and to said lens mounting and said lens.

7. A fixture according to claim 1 which further comprises a rear member within said housing normally disposed substantially parallel to said mounting means,

a safety limit switch carried by said rear member having a button resiliently biased outward toward a first position, said button being moved to a second position by said button engaging said mounting means when said rear member is disposed substantially parallel to said mounting means whereby force applied to said housing by an external object striking said housing causes said rear member to pivot outward away from said mounting means said button to move to first position, when said force is sufficient to damage said fixture or said external object.

8. A fixture according to claim 7 in which said mounting means is formed with a horizontal longitudinally extending interlock receptor along its top edge and said rear member is formed with a top lug fitting into said receptor so that said housing hangs from said receptor and may pivot upward relative to said mounting means.

9. A fixture according to claim 8 which further comprises adjustment screws in said housing engaging the bottom edge of said mounting means, said screws controlling the extent of pivotal movement of said rear member relative to said mounting means.

10. A fixture according to claim 8 in which said mounting means is formed with an opening for protrusion of a first electrical connector for power for said fixture, said housing having a second electrical connector mating with said first connector, whereby said fixture may be placed on a wall by first attaching said mounting means to said wall, then hanging said top lug on said receptor and engaging said first and second connectors and then pivoting said housing down so that said rear member is substantially flush with said mounting means.

11. A fixture according to claim 1 in which said arcuate member, opaque lens mounting, lens, and mounting disks are at all times confined within said housing regardless of the position of adjustment of said lens.

* * * * *

STATEMENT OF IAN LEWIN

EXHIBIT E

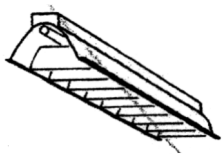
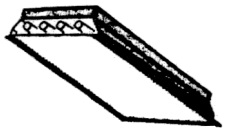
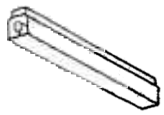
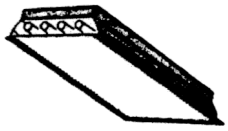
Fig. 9-34. *Continued*

Typical Luminaire	Typical Intensity Distribution and Per Cent Lamp Lumens	Maint. Cat.	SC	RCR ↓	ρcc →	80			70			50			30			10			0	WDRC	ρcc →
					ρw →	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0		
						Coefficients of Utilization for 20 Per Cent Effective Floor Cavity Reflectance (ρ_{FC} = 20)																
31		IV	1.5/1.2	0		.69	.69	.69	.67	.67	.67	.64	.64	.64	.62	.62	.62	.59	.59	.59	.58		
				1		.62	.61	.59	.61	.59	.58	.59	.57	.56	.57	.55	.54	.55	.54	.53	.52	.159	1
				2		.56	.53	.50	.55	.52	.50	.53	.50	.48	.51	.49	.47	.49	.48	.46	.45	.160	2
				3		.50	.46	.43	.49	.46	.43	.48	.44	.42	.46	.43	.41	.45	.42	.41	.39	.155	3
				4		.45	.41	.37	.44	.40	.37	.43	.39	.36	.42	.38	.36	.40	.38	.36	.34	.147	4
				5		.40	.36	.32	.40	.36	.32	.39	.35	.32	.38	.34	.32	.37	.34	.31	.30	.139	5
				6		.37	.32	.29	.36	.32	.28	.35	.31	.28	.34	.31	.28	.33	.30	.28	.27	.131	6
				7		.33	.29	.25	.33	.28	.25	.32	.28	.25	.31	.28	.25	.30	.27	.25	.24	.123	7
				8		.30	.26	.23	.30	.26	.22	.29	.25	.22	.28	.25	.22	.28	.25	.22	.21	.115	8
				9		.28	.23	.20	.27	.23	.20	.27	.23	.20	.26	.23	.20	.26	.22	.20	.19	.109	9
150 mm × 150 mm (6 × 6") cell parabolic wedge louver—multiply by 1.1 for 250 × 250 mm (10 × 10") cells				10		.26	.21	.18	.25	.21	.18	.25	.21	.18	.24	.21	.18	.24	.20	.18	.17	.102	10
32		I	1.3	0		1.02	1.02	1.02	.99	.99	.99	.92	.92	.92	.86	.86	.86	.81	.81	.81	.78		
				1		.85	.80	.76	.82	.78	.74	.76	.73	.70	.71	.68	.66	.67	.64	.62	.60	.467	1
				2		.72	.65	.59	.70	.63	.58	.65	.60	.55	.61	.56	.52	.57	.53	.50	.47	.387	2
				3		.63	.55	.48	.60	.53	.47	.56	.50	.45	.53	.47	.43	.49	.45	.41	.38	.331	3
				4		.55	.46	.40	.53	.45	.39	.50	.43	.37	.46	.41	.36	.43	.38	.34	.32	.289	4
				5		.49	.40	.34	.47	.39	.33	.44	.37	.32	.41	.35	.31	.39	.34	.29	.27	.255	5
				6		.43	.35	.29	.42	.34	.29	.40	.33	.28	.37	.31	.27	.35	.30	.26	.23	.228	6
2-lamp, surface mounted, bare lamp unit—photometry with 460 mm (18") wide panel above luminaire—lamps on 150 mm (6") centers				7		.39	.31	.25	.38	.30	.25	.36	.29	.24	.34	.28	.23	.32	.26	.22	.20	.206	7
				8		.36	.28	.22	.35	.27	.22	.33	.26	.21	.31	.25	.21	.29	.24	.20	.18	.188	8
				9		.33	.25	.20	.32	.25	.20	.30	.24	.19	.28	.23	.18	.27	.22	.18	.16	.173	9
				10		.30	.23	.18	.29	.22	.18	.28	.21	.17	.26	.21	.17	.25	.20	.16	.14	.159	10
33		VI	N.A.	0		.77	.77	.77	.68	.68	.68	.50	.50	.50	.34	.34	.34	.19	.19	.19	.		
				1		.67	.64	.61	.59	.56	.54	.43	.42	.41	.29	.29	.28	.17	.16	.16	.		
				2		.58	.54	.50	.51	.48	.44	.38	.36	.34	.26	.24	.23	.14	.14	.13	.		
				3		.51	.46	.42	.45	.41	.37	.33	.30	.28	.23	.21	.19	.13	.12	.11	.		
				4		.45	.39	.35	.40	.35	.31	.30	.26	.24	.20	.18	.17	.11	.10	.10	.		
				5		.40	.34	.30	.35	.30	.26	.26	.23	.20	.18	.16	.14	.10	.09	.08	.		
				6		.36	.30	.25	.31	.26	.23	.24	.20	.17	.16	.14	.12	.09	.08	.07	.		
				7		.32	.26	.22	.28	.23	.20	.21	.18	.15	.15	.12	.11	.08	.07	.06	.		
				8		.29	.23	.19	.26	.21	.17	.19	.16	.13	.13	.11	.09	.08	.06	.06	.		
				9		.26	.21	.17	.23	.18	.15	.17	.14	.12	.12	.10	.08	.07	.06	.05	.		
Luminous bottom suspended unit with extra-high output lamp				10		.24	.19	.15	.21	.17	.13	.16	.13	.10	.11	.09	.07	.06	.05	.04	.		
34		VI	1.4/1.2	0		.91	.91	.91	.85	.85	.85	.74	.74	.74	.64	.64	.64	.54	.54	.54	.50		
				1		.80	.77	.74	.75	.72	.70	.65	.63	.61	.57	.55	.54	.49	.47	.47	.43	.179	1
				2		.70	.65	.61	.66	.62	.58	.58	.54	.52	.50	.48	.46	.43	.42	.40	.37	.166	2
				3		.62	.56	.51	.58	.53	.49	.51	.47	.44	.45	.42	.39	.39	.37	.35	.32	.153	3
				4		.55	.49	.44	.52	.46	.42	.46	.41	.38	.40	.37	.34	.35	.32	.30	.27	.140	4
				5		.50	.43	.38	.47	.41	.36	.41	.37	.33	.36	.33	.30	.32	.29	.26	.24	.129	5
				6		.45	.38	.33	.42	.36	.32	.37	.33	.29	.33	.29	.26	.29	.26	.23	.21	.119	6
				7		.40	.34	.29	.38	.32	.28	.34	.29	.26	.30	.26	.23	.26	.23	.21	.19	.111	7
				8		.37	.30	.26	.35	.29	.25	.31	.26	.23	.28	.24	.21	.24	.21	.19	.17	.103	8
				9		.34	.27	.23	.32	.26	.22	.29	.24	.21	.25	.22	.19	.22	.19	.17	.15	.096	9
Prismatic bottom and sides, open top, 4-lamp suspended unit—see note 7				10		.31	.25	.21	.29	.24	.20	.26	.22	.19	.23	.20	.17	.21	.18	.15	.14	.090	10
35		V	1.5/1.2	0		.81	.81	.81	.78	.78	.78	.72	.72	.72	.66	.66	.66	.61	.61	.61	.59		
				1		.71	.68	.66	.68	.66	.63	.63	.61	.59	.58	.57	.56	.54	.53	.52	.50	.223	1
				2		.63	.58	.55	.60	.56	.53	.56	.53	.50	.52	.50	.47	.48	.46	.45	.43	.201	2
				3		.56	.50	.46	.54	.49	.45	.50	.46	.43	.47	.43	.41	.43	.41	.39	.37	.183	3
				4		.50	.44	.40	.48	.43	.39	.45	.40	.37	.42	.38	.35	.39	.36	.34	.32	.167	4
				5		.45	.39	.34	.43	.38	.34	.40	.36	.32	.38	.34	.31	.35	.32	.30	.28	.153	5
				6		.40	.34	.30	.39	.34	.30	.37	.32	.28	.34	.30	.27	.32	.29	.26	.25	.142	6
				7		.37	.31	.27	.35	.30	.26	.33	.29	.25	.31	.27	.24	.30	.26	.23	.22	.131	7
				8		.33	.28	.24	.32	.27	.23	.30	.26	.23	.29	.25	.22	.27	.24	.21	.20	.122	8
				9		.31	.25	.21	.30	.25	.21	.28	.24	.20	.26	.23	.20	.25	.22	.19	.18	.114	9
				10		.28	.23	.19	.27	.22	.19	.26	.21	.18	.24	.21	.18	.23	.20	.17	.16	.107	10
36		V	1.2	0		.82	.82	.82	.77	.77	.77	.69	.69	.69	.61	.61	.61	.53	.53	.53	.50		
				1		.71	.67	.65	.67	.64	.61	.59	.57	.55	.52	.51	.49	.46	.45	.44	.40	.234	1
				2		.62	.57	.53	.59	.54	.51	.52	.49	.46	.46	.44	.41	.41	.39	.37	.34	.194	2
				3		.55	.49	.45	.52	.47	.43	.46	.42	.39	.41	.38	.36	.37	.34	.32	.30	.168	3
				4		.49	.43	.39	.47	.41	.37	.42	.37	.34	.37	.34	.31	.33	.30	.28	.26	.150	4
				5		.44	.38	.34	.42	.36	.32	.38	.33	.30	.34	.30	.27	.30	.27	.25	.23	.135	5
				6		.40	.34	.29	.38	.32	.28	.34	.30	.26	.31	.27	.24	.28	.25	.22	.20	.123	6
				7		.36	.30	.26	.35	.29	.25	.31	.27	.23	.28	.25	.22	.25	.22	.20	.18	.112	7
				8		.33	.27	.23	.32	.26	.23	.29	.24	.21	.26	.22	.20	.23	.20	.18	.16	.104	8
				9		.30	.25	.21	.29	.24	.20	.26	.22	.19	.24	.20	.18	.22	.19	.16	.15	.097	9
2-lamp prismatic wraparound—see note 7				10		.28	.23	.19	.27	.22	.18	.25	.20	.17	.22	.19	.16	.20	.17	.15	.14	.090	10

STATEMENT OF IAN LEWIN

EXHIBIT F

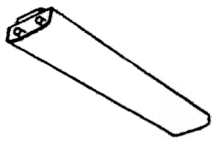
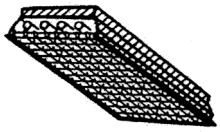
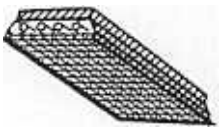
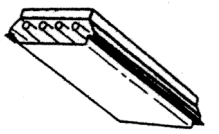
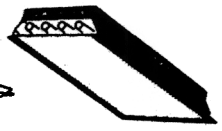
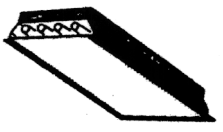
Fig. 9-34. *Continued*

Typical Luminaire	Typical Intensity Distribution and Per Cent Lamp Lumens		RCR ↓	ρcc →	80			70			50			30			10			0	WDRC	ρcc →
				ρw →	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0		ρw →
	Maint. Cat.	SC		Coefficients of Utilization for 20 Per Cent Effective Floor Cavity Reflectance (ρ_{FC} = 20)																	RCR ↓
43  4-lamp, 610 mm (2′) wide unit with sharp cutoff (high angle—low luminance) flat prismatic lens—see note 7	V	1.4/1.3	0	.78	.78	.78	.76	.76	.76	.73	.73	.73	.70	.70	.70	.67	.67	.67	.66		
			1	.71	.68	.66	.69	.67	.65	.66	.65	.63	.64	.63	.61	.62	.61	.60	.58	.181	1
			2	.63	.60	.57	.62	.59	.56	.60	.57	.55	.58	.56	.54	.56	.54	.52	.51	.180	2
			3	.57	.52	.49	.56	.52	.48	.54	.51	.48	.52	.49	.47	.51	.48	.46	.45	.173	3
			4	.51	.46	.43	.50	.46	.42	.49	.45	.42	.47	.44	.41	.46	.43	.41	.39	.164	4
			5	.46	.41	.37	.46	.41	.37	.44	.40	.37	.43	.39	.36	.42	.39	.36	.35	.154	5
			6	.42	.37	.33	.41	.37	.33	.40	.36	.33	.39	.35	.32	.38	.35	.32	.31	.145	6
			7	.38	.33	.29	.38	.33	.29	.37	.32	.29	.36	.32	.29	.35	.32	.29	.28	.136	7
			8	.35	.30	.26	.35	.30	.26	.34	.29	.26	.33	.29	.26	.32	.29	.26	.25	.127	8
			9	.32	.27	.24	.32	.27	.24	.31	.27	.24	.31	.27	.24	.30	.26	.24	.22	.120	9
			10	.30	.25	.22	.30	.25	.22	.29	.25	.22	.28	.24	.22	.28	.24	.21	.20	.113	10
44  Bilateral batwing distribution—louvered fluorescent unit	IV	N.A.	0	.71	.71	.71	.70	.70	.70	.66	.66	.66	.64	.64	.64	.61	.61	.61	.60		
			1	.64	.62	.60	.63	.61	.60	.60	.59	.58	.58	.57	.56	.56	.55	.54	.53	.167	1
			2	.57	.54	.51	.56	.53	.51	.54	.52	.50	.52	.50	.48	.51	.49	.47	.46	.170	2
			3	.51	.47	.44	.50	.46	.43	.49	.45	.43	.47	.44	.42	.46	.43	.41	.40	.165	3
			4	.46	.41	.38	.45	.41	.37	.44	.40	.37	.42	.39	.36	.41	.38	.36	.35	.157	4
			5	.41	.36	.33	.40	.36	.32	.39	.35	.32	.38	.35	.32	.37	.34	.31	.30	.148	5
			6	.37	.32	.28	.36	.32	.28	.35	.31	.28	.34	.31	.28	.34	.30	.28	.27	.139	6
			7	.33	.29	.25	.33	.28	.25	.32	.28	.25	.31	.27	.25	.30	.27	.24	.23	.130	7
			8	.30	.26	.22	.30	.25	.22	.29	.25	.22	.28	.25	.22	.28	.24	.22	.21	.122	8
			9	.28	.23	.20	.27	.23	.20	.27	.23	.20	.26	.22	.20	.25	.22	.19	.18	.115	9
			10	.25	.21	.18	.25	.21	.18	.25	.20	.18	.24	.20	.18	.23	.20	.18	.17	.108	10
45  Bilateral batwing distribution—4-lamp, 610 mm (2′) wide fluorescent unit with flat prismatic lens and overlay—see note 7	V	N.A.	0	.57	.57	.57	.56	.56	.56	.53	.53	.53	.51	.51	.51	.49	.49	.49	.48		
			1	.50	.48	.46	.49	.47	.45	.47	.45	.44	.45	.43	.42	.43	.42	.41	.40	.204	1
			2	.43	.40	.37	.42	.39	.36	.40	.38	.35	.39	.37	.35	.37	.36	.34	.33	.192	2
			3	.37	.33	.30	.37	.33	.30	.35	.32	.29	.34	.31	.29	.33	.30	.28	.27	.175	3
			4	.33	.28	.25	.32	.28	.25	.31	.27	.24	.30	.27	.24	.29	.26	.24	.23	.159	4
			5	.29	.24	.21	.28	.24	.21	.27	.24	.21	.26	.23	.20	.25	.23	.20	.19	.145	5
			6	.26	.21	.18	.25	.21	.18	.24	.21	.18	.24	.20	.18	.23	.20	.17	.16	.132	6
			7	.23	.19	.16	.23	.18	.15	.22	.18	.15	.21	.18	.15	.21	.17	.15	.14	.122	7
			8	.21	.17	.14	.21	.16	.14	.20	.16	.13	.19	.16	.13	.19	.16	.13	.12	.112	8
			9	.19	.15	.12	.19	.15	.12	.18	.14	.12	.18	.14	.12	.17	.14	.12	.11	.104	9
			10	.17	.13	.11	.17	.13	.11	.17	.13	.11	.16	.13	.11	.16	.13	.10	.10	.096	10
46  Bilateral batwing distribution—one-lamp, surface mounted fluorescent with prismatic wraparound lens	V	N.A.	0	.87	.87	.87	.84	.84	.84	.77	.77	.77	.72	.72	.72	.66	.66	.66	.64		
			1	.75	.72	.69	.72	.69	.66	.67	.64	.62	.62	.60	.58	.57	.56	.54	.52	.296	1
			2	.65	.60	.56	.63	.58	.54	.58	.54	.51	.54	.51	.48	.50	.47	.45	.43	.261	2
			3	.57	.51	.46	.55	.49	.45	.51	.46	.42	.47	.43	.40	.44	.41	.38	.36	.232	3
			4	.50	.44	.39	.48	.42	.38	.45	.40	.36	.42	.38	.34	.39	.35	.32	.30	.209	4
			5	.45	.38	.33	.43	.37	.32	.40	.35	.31	.37	.33	.29	.35	.31	.28	.26	.189	5
			6	.40	.33	.28	.39	.32	.28	.36	.31	.26	.34	.29	.25	.31	.27	.24	.22	.172	6
			7	.36	.29	.25	.35	.29	.24	.32	.27	.23	.30	.26	.22	.28	.24	.21	.19	.158	7
			8	.33	.26	.22	.31	.25	.21	.29	.24	.20	.28	.23	.20	.26	.22	.19	.17	.146	8
			9	.30	.23	.19	.29	.23	.19	.27	.22	.18	.25	.21	.17	.24	.20	.17	.15	.135	9
			10	.27	.21	.17	.26	.21	.17	.25	.20	.16	.23	.19	.16	.22	.18	.15	.13	.126	10
47  Radial batwing distribution—4-lamp, 610 mm (2′) wide fluorescent unit with flat prismatic lens—see note 7	V	1.7	0	.71	.71	.71	.69	.69	.69	.66	.66	.66	.63	.63	.63	.61	.61	.61	.60		
			1	.62	.59	.57	.60	.58	.56	.58	.56	.54	.55	.54	.52	.53	.52	.51	.50	.251	
			2	.53	.49	.46	.52	.48	.45	.50	.47	.44	.48	.45	.43	.46	.44	.42	.41	.237	2
			3	.46	.41	.37	.45	.41	.37	.44	.40	.36	.42	.39	.36	.40	.38	.35	.34	.216	3
			4	.41	.35	.31	.40	.35	.31	.38	.34	.30	.37	.33	.30	.36	.32	.30	.28	.196	4
			5	.36	.30	.26	.35	.30	.26	.34	.29	.26	.33	.29	.26	.32	.28	.25	.24	.178	5
			6	.32	.27	.23	.32	.26	.23	.31	.26	.22	.29	.25	.22	.29	.25	.22	.21	.162	6
			7	.29	.24	.20	.28	.23	.20	.28	.23	.19	.27	.22	.19	.26	.22	.19	.18	.149	7
			8	.26	.21	.17	.26	.21	.17	.25	.20	.17	.24	.20	.17	.24	.20	.17	.16	.137	8
			9	.24	.19	.15	.24	.19	.15	.23	.18	.15	.22	.18	.15	.22	.18	.15	.14	.127	9
			10	.22	.17	.14	.22	.17	.14	.21	.17	.14	.20	.16	.14	.20	.16	.14	.12	.118	10
48  2-lamp fluorescent strip unit	I	1.6/1.2	0	1.01	1.01	1.01	.96	.96	.96	.87	.87	.87	.79	.79	.79	.72	.72	.72	.68		
			1	.84	.79	.75	.80	.76	.72	.72	.69	.66	.65	.63	.60	.59	.57	.55	.52	.414	1
			2	.72	.65	.59	.68	.62	.57	.62	.57	.52	.56	.52	.48	.50	.47	.44	.41	.343	2
			3	.62	.54	.48	.59	.52	.46	.53	.47	.42	.48	.43	.39	.43	.39	.36	.33	.293	3
			4	.54	.46	.39	.52	.44	.38	.47	.40	.35	.42	.37	.33	.38	.34	.30	.27	.255	4
			5	.48	.40	.33	.46	.38	.32	.41	.35	.30	.38	.32	.28	.34	.29	.26	.23	.225	5
			6	.43	.35	.29	.41	.33	.28	.37	.31	.26	.34	.28	.24	.30	.26	.22	.20	.202	6
			7	.38	.30	.25	.37	.29	.24	.34	.27	.22	.31	.25	.21	.28	.23	.19	.17	.182	7
			8	.35	.27	.22	.33	.26	.21	.31	.24	.20	.28	.22	.18	.25	.21	.17	.15	.166	8
			9	.32	.24	.19	.30	.24	.19	.28	.22	.18	.26	.20	.16	.23	.19	.15	.13	.152	9
			10	.29	.22	.17	.28	.21	.17	.26	.20	.16	.24	.18	.15	.22	.17	.14	.12	.140	10

STATEMENT OF IAN LEWIN

EXHIBIT G

Fig. 9-34. *Continued*

Typical Luminaire	Typical Intensity Distribution and Per Cent Lamp Lumens		ρ_{CC} →	80			70			50			30			10			0	WDRC	ρ_{CC} →
			ρ_W →	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0		ρ_W →
	Maint. Cat.	SC	RCR ↓	Coefficients of Utilization for 20 Per Cent Effective Floor Cavity Reflectance (ρ_{FC} = 20)																	RCR ↓
37  2-lamp diffuse wraparound—see note 7	V	1.3	0	.52	.52	.52	.50	.50	.50	.46	.46	.46	.43	.43	.43	.39	.39	.39	.38		
			1	.44	.42	.40	.42	.40	.39	.39	.37	.36	.36	.35	.33	.33	.32	.31	.30	.201	1
			2	.38	.35	.32	.37	.33	.31	.34	.31	.29	.31	.29	.27	.28	.27	.25	.24	.171	2
			3	.33	.29	.26	.32	.28	.25	.29	.26	.24	.27	.25	.22	.25	.23	.21	.20	.149	3
			4	.29	.25	.22	.28	.24	.21	.26	.23	.20	.24	.21	.19	.22	.20	.18	.17	.132	4
			5	.26	.22	.19	.25	.21	.18	.23	.20	.17	.21	.18	.16	.20	.17	.15	.14	.117	5
			6	.23	.19	.16	.22	.18	.16	.21	.17	.15	.19	.16	.14	.18	.15	.13	.12	.106	6
			7	.21	.17	.14	.20	.16	.14	.19	.15	.13	.17	.15	.12	.16	.14	.12	.11	.096	7
			8	.19	.15	.12	.18	.15	.12	.17	.14	.12	.16	.13	.11	.15	.12	.11	.10	.088	8
			9	.17	.14	.11	.17	.13	.11	.16	.13	.10	.15	.12	.10	.14	.11	.09	.09	.081	9
			10	.16	.12	.10	.15	.12	.10	.14	.11	.09	.14	.11	.09	.13	.10	.09	.08	.075	10
38  4-lamp, 610 mm (2′) wide troffer with 45° plastic louver—see note 7	IV	1.0	0	.60	.60	.60	.58	.58	.58	.56	.56	.56	.53	.53	.53	.51	.51	.51	.50		
			1	.53	.51	.49	.52	.50	.49	.50	.48	.47	.48	.47	.46	.46	.45	.44	.43	.168	1
			2	.47	.44	.42	.46	.43	.41	.44	.42	.40	.43	.41	.39	.41	.40	.38	.37	.159	2
			3	.42	.38	.36	.41	.38	.35	.40	.37	.35	.39	.36	.34	.37	.35	.34	.32	.146	3
			4	.38	.34	.31	.37	.34	.31	.36	.33	.30	.35	.32	.30	.34	.32	.30	.29	.135	4
			5	.34	.30	.27	.34	.30	.27	.33	.29	.27	.32	.29	.27	.31	.28	.26	.25	.124	5
			6	.31	.27	.24	.31	.27	.24	.30	.27	.24	.29	.26	.24	.28	.26	.24	.23	.114	6
			7	.29	.25	.22	.28	.24	.22	.28	.24	.22	.27	.24	.21	.26	.23	.21	.20	.106	7
			8	.26	.22	.20	.26	.22	.20	.25	.22	.20	.25	.22	.20	.24	.21	.19	.19	.099	8
			9	.24	.21	.18	.24	.21	.18	.24	.20	.18	.23	.20	.18	.23	.20	.18	.17	.092	9
			10	.23	.19	.17	.22	.19	.17	.22	.19	.16	.22	.19	.16	.21	.18	.16	.16	.086	10
39  4-lamp, 610 mm (2′) wide troffer with 45° white metal louver—see note 7	IV	0.9	0	.55	.55	.55	.54	.54	.54	.51	.51	.51	.49	.49	.49	.47	.47	.47	.46		
			1	.49	.48	.46	.48	.47	.46	.46	.45	.44	.45	.44	.43	.43	.42	.42	.41	.137	1
			2	.44	.42	.40	.43	.41	.39	.42	.40	.38	.40	.39	.37	.39	.38	.37	.36	.131	2
			3	.40	.37	.34	.39	.36	.34	.38	.36	.33	.37	.35	.33	.36	.34	.32	.32	.122	3
			4	.36	.33	.30	.36	.33	.30	.35	.32	.30	.34	.31	.29	.33	.31	.29	.28	.113	4
			5	.33	.30	.27	.33	.29	.27	.32	.29	.27	.31	.28	.26	.30	.28	.26	.25	.104	5
			6	.30	.27	.24	.30	.27	.24	.29	.26	.24	.29	.26	.24	.28	.25	.24	.23	.097	6
			7	.28	.25	.22	.28	.24	.22	.27	.24	.22	.26	.24	.22	.26	.23	.22	.21	.090	7
			8	.26	.23	.20	.26	.22	.20	.25	.22	.20	.25	.22	.20	.24	.22	.20	.19	.085	8
			9	.24	.21	.19	.24	.21	.19	.23	.20	.18	.23	.20	.18	.23	.20	.18	.18	.079	9
			10	.23	.19	.17	.22	.19	.17	.22	.19	.17	.22	.19	.17	.21	.19	.17	.16	.075	10
40  Fluorescent unit dropped diffuser, 4-lamp 610 mm (2′) wide—see note 7	V	1.2	0	.73	.73	.73	.71	.71	.71	.68	.68	.68	.65	.65	.65	.62	.62	.62	.60		
			1	.63	.60	.58	.62	.59	.57	.59	.57	.55	.56	.55	.53	.54	.53	.51	.50	.259	1
			2	.55	.51	.47	.54	.50	.46	.51	.48	.45	.49	.46	.44	.47	.45	.43	.42	.236	2
			3	.48	.43	.39	.47	.42	.39	.45	.41	.38	.43	.40	.37	.42	.39	.36	.35	.212	3
			4	.43	.37	.33	.42	.37	.33	.40	.36	.32	.39	.35	.32	.37	.34	.31	.30	.191	4
			5	.38	.33	.29	.37	.32	.28	.36	.31	.28	.35	.31	.28	.33	.30	.27	.26	.173	5
			6	.34	.29	.25	.34	.29	.25	.33	.28	.24	.31	.27	.24	.30	.27	.24	.23	.158	6
			7	.31	.26	.22	.31	.26	.22	.30	.25	.22	.29	.25	.21	.28	.24	.21	.20	.144	7
			8	.28	.23	.20	.28	.23	.20	.27	.23	.19	.26	.22	.19	.25	.22	.19	.18	.133	8
			9	.26	.21	.18	.26	.21	.18	.25	.21	.17	.24	.20	.17	.24	.20	.17	.16	.123	9
			10	.24	.19	.16	.24	.19	.16	.23	.19	.16	.22	.19	.16	.22	.18	.16	.15	.115	10
41  Fluorescent unit with flat bottom diffuser, 4-lamp 610 mm (2′) wide—see note 7	V	1.2	0	.69	.69	.69	.67	.67	.67	.64	.64	.64	.61	.61	.61	.59	.59	.59	.58		
			1	.60	.58	.55	.59	.57	.55	.56	.55	.53	.54	.53	.51	.52	.51	.50	.49	.227	1
			2	.52	.49	.45	.51	.48	.45	.49	.46	.44	.47	.45	.43	.46	.44	.42	.40	.214	2
			3	.46	.41	.38	.45	.41	.37	.43	.40	.37	.42	.39	.36	.40	.38	.35	.34	.196	3
			4	.41	.36	.32	.40	.35	.32	.39	.34	.31	.37	.34	.31	.36	.33	.30	.29	.178	4
			5	.36	.31	.28	.36	.31	.27	.35	.30	.27	.33	.30	.27	.32	.29	.26	.25	.162	5
			6	.33	.28	.24	.32	.27	.24	.31	.27	.24	.30	.26	.23	.29	.26	.23	.22	.148	6
			7	.30	.25	.21	.29	.25	.21	.28	.24	.21	.28	.24	.21	.27	.23	.21	.20	.136	7
			8	.27	.22	.19	.27	.22	.19	.26	.22	.19	.25	.21	.19	.25	.21	.19	.17	.126	8
			9	.25	.20	.17	.25	.20	.17	.24	.20	.17	.23	.20	.17	.23	.19	.17	.16	.116	9
			10	.23	.18	.15	.23	.18	.15	.22	.18	.15	.22	.18	.15	.21	.18	.15	.14	.108	10
42  Fluorescent unit with flat prismatic lens, 4-lamp 610 mm (2′) wide—see note 7	V	1.4/1.2	0	.75	.75	.75	.73	.73	.73	.70	.70	.70	.67	.67	.67	.64	.64	.64	.63		
			1	.67	.64	.62	.65	.63	.61	.63	.61	.59	.60	.59	.58	.58	.57	.56	.55	.208	1
			2	.59	.56	.52	.58	.55	.52	.56	.53	.51	.54	.52	.49	.52	.50	.48	.47	.199	2
			3	.53	.48	.45	.52	.48	.44	.50	.46	.43	.48	.45	.43	.47	.44	.42	.41	.186	3
			4	.47	.42	.38	.46	.42	.38	.45	.41	.38	.44	.40	.37	.42	.39	.37	.35	.172	4
			5	.43	.37	.34	.42	.37	.33	.41	.36	.33	.39	.36	.33	.38	.35	.32	.31	.160	5
			6	.39	.33	.30	.38	.33	.29	.37	.32	.29	.36	.32	.29	.35	.31	.29	.27	.148	6
			7	.35	.30	.26	.35	.30	.26	.34	.29	.26	.33	.29	.26	.32	.28	.26	.24	.138	7
			8	.32	.27	.24	.32	.27	.23	.31	.26	.23	.30	.26	.23	.29	.26	.23	.22	.128	8
			9	.30	.25	.21	.29	.24	.21	.28	.24	.21	.28	.24	.21	.27	.24	.21	.20	.120	9
			10	.27	.22	.19	.27	.22	.19	.26	.22	.19	.26	.22	.19	.25	.22	.19	.18	.113	10

STATEMENT OF IAN LEWIN

EXHIBIT H

constructed that the housing forms the reflecting surface. The assembly is enclosed by a cover glass.

germicidal effectiveness† See *bactericidal (germicidal) effectiveness.*

germicidal efficiency of radiant flux† See *bactericidal (germicidal) efficiency of radiant flux.*

germicidal exposure† See *bactericidal (germicidal) exposure.*

germicidal flux and flux density† See *bactericidal (germicidal) flux* and *bactericidal (germicidal) flux density.*

germicidal lamp a low-pressure mercury lamp in which the envelope has high transmittance for 254-nm radiation. See *bactericidal lamp.*

glare the sensation produced by luminances within the visual field that are sufficiently greater than the luminance to which the eyes are adapted, which causes annoyance, discomfort, or loss in visual performance and visibility. See *blinding glare, direct glare, disability glare,* and *discomfort glare.*

Note The magnitude of the sensation of glare depends on such factors as the size, position, and luminance of a source; the number of sources; and the luminance to which the eyes are adapted.

globe a transparent or diffusing enclosure intended to protect a lamp, to diffuse and redirect its light, or to change the color of the light.

glossometer an instrument for measuring gloss as a function of the directionally selective reflecting properties of a material in angles near to and including the direction giving specular reflection.

glow discharge an electric discharge characterized by a low, approximately constant current density at the cathode (on the order of 10 $\mu A/mm^2$) at low cathode temperature and a high voltage drop (typically 50 V or more). Secondary emission from the cathode is much greater than the thermionic emission.

Note A distinction is made between the normal cathode drop (potential difference due to space charge near the cathode) that occurs when the glow does not cover the cathode completely (with constant current density) and that is independent of the discharge current, and the abnormal cathode drop that occurs when the glow covers the cathode completely (with increased current density) and that depends on the discharge current.

glow factor a measure of the visible light response of a fluorescent material to black light. It is equal to π times the luminance in cd/m^2 produced on the material divided by the incident black-light flux density in mW/m^2. It can be measured in lm/mW.

glow lamp an electric-discharge lamp whose mode of operation is that of a glow discharge and in which light is generated in the space close to the electrodes.

goniophotometer a photometer for measuring the directional light distribution characteristics of sources, luminaires, media, and surfaces.

graybody a temperature radiator whose spectral emissivity is less than unity and the same at all wavelengths.

ground-area open floodlight (O) a unit providing a weatherproof enclosure for the lamp socket and housing. No cover glass is required.

ground-area open floodlight with reflector insert (OI) a weatherproof unit so constructed that the housing forms only part of the reflecting surface. An auxiliary reflector is used to modify the distribution of light. No cover glass is required.

ground light visible radiation from the sun and sky reflected by surfaces below the plane of the horizon.

group flashing light a flashing light in which the flashes are combined in groups, each including the same number of flashes, and in which the groups are repeated at regular intervals. The duration of each flash is clearly less than the duration of the dark periods between flashes, and the duration of the dark periods between flashes is clearly less than the duration of the dark periods between groups.

H

hard light light that causes an object to cast a sharply defined shadow.

hazard or obstruction beacon an aeronautical beacon used to designate a danger to air navigation.

hazardous location an area where ignitable vapors or dust can cause a fire or explosion created by energy emitted from lighting or other electrical equipment or by electrostatic generation.

headlamp a major lighting device mounted on a vehicle and used to provide illumination ahead of it. Also called a *headlight.* See *multiple-beam headlamp* and *sealed-beam headlamp.*

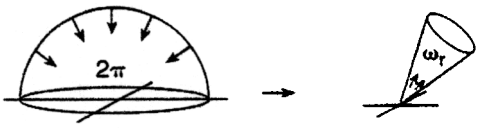
headlight† an alternative term for headlamp.

heat extraction thermal factor the fractional lumen loss or gain due to passage of room air being returned to the plenum through the lamp compartment of the luminaire.

heavy-duty floodlight (HD) a weatherproof unit having a substantially constructed metal housing into which is placed a separate and removable reflector. A weatherproof hinged door with cover glass encloses the assembly but provides an unobstructed light opening at least equal to the effective diameter of the reflector.

hemispherical-conical reflectance, $\rho(2\pi; \omega_r)$ the ratio of reflected flux collected over a conical solid angle to the incident flux from the entire hemisphere.

Note The direction and extent of the cone must be specified.



Hemispherical Incident → Conical Collected

DEFENDANT'S MARKMAN STATEMENT

EXHIBIT 3

Webster's Third New International Dictionary

OF THE ENGLISH LANGUAGE

UNABRIDGED

a Merriam-Webster

Utilizing all the experience and resources of more than one hundred years of Merriam-Webster® dictionaries

EDITED IN CHIEF BY PHILIP BABCOCK GOVE

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A GENUINE MERRIAM-WEBSTER

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ISBN 0-87779-206-2 (imperial buckram)

MADE IN THE UNITED STATES OF AMERICA
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at FIRE] : MIZZONITE; *specif* : a variety of scapolite with the components marialite and meionite in a ratio of about 3:2

dir *abbr* **1** direction; directional **2** director

di-radical \(ˈ)dī+\ *n* -s [*di-* + *radical*] : BIRADICAL

dir-ca \ˈdərkə\ *n* [NL, fr. L *Dirce*, a fountain near Thebes in Boeotia, fr. Gk *Dirkē*] **1** *cap* : a genus of shrubs (family Thymelaeaceae) having tough fibrous bark and clusters of yellow flowers — see LEATHERWOOD 1a **2** -s : any plant of the genus *Dirca*

¹dird \ˈdird\ *n* -s [prob. short for *dirdum*] *Scot* : a powerful blow or stroke

²dird \"\ *vb, Scot* : BUMP, BOUNCE, JOLT

dir-dum \ˈdirdəm\ *n* -s [ME (northern dial.) *durdan*, fr. ScGael, grumbling, hum, dim. of *durd* hum, word, sound; akin to IrGael *dordan* hum, buzz, *dord* humming, buzzing] **1** *Scot* : UPROAR, FUSS **2** *Scot* **a** : REBUKE, SCOLDING **b** : BLAME, PUNISHMENT **3** *Scot* : a piece of bad luck : MISFORTUNE

dire \ˈdī(ə)r, -īə\ *adj* -ER/-EST [L *dirus*; akin to Gk *deidienai* to fear, *deos* fear, *deinos* terrible, Av *dvaēthā* threat, Skt *dveṣṭi* he hates] **1 a** : exciting horror or terror esp. because of the great suffering or loss or devastating ruin actually caused or only threatened ⟨the ~ days of bombing raids⟩ ⟨if South America were to seek her imports elsewhere, it would be a ~ blow to us —Gustave Weigel⟩ ⟨the ~ fate which the Lord had seen fit to visit upon her sinful employers —W.H.Wright⟩ **b** : inducing mental suffering or depression by reason of concern with a dreaded eventuality or a grievous circumstance : AFFLICTIVE, PAINFUL ⟨palsied by the ~ news of the president's death⟩ **c** : oppressive to the feelings or spirit : DISMAL, CHEERLESS ⟨the heavy drag of winter is then at its most ~ —F.M.Ford⟩ ⟨despite its ~ point of view, the book jests and jostles with life —*Time*⟩ **2** : warning of disaster to come : OMINOUS, SINISTER ⟨in the fight against foot-and-mouth disease proposals to substitute vaccination for eradication evoked ~ forecasts⟩ **3 a** : demanding immediate action to fend off disastrous consequences : EXIGENT, URGENT ⟨spokesmen talked about the ~ need for school buildings, which had been at least equally ~ during the previous two years —W.L.Miller⟩ ⟨this was due to ~ necessities elsewhere and not to direct intent or indifference —Herbert Feis⟩ **b** : close to the utmost limit of sufferance : most acute : EXTREME, DESPERATE ⟨scope is left for instantaneous action, but only in the *direst* emergency —A.P.Ryan⟩ ⟨while their means were always modest there was no trace of ~ poverty —J.T.Ellis⟩ ⟨left his family in ~ financial straits⟩

syn see FEARFUL

¹di-rect \də'rekt *also* dī'r- *sometimes* 'dī,r-— compare DIRECT\ *vb* -ED/-ING/-S [ME *directen*, fr. L *directus*, past part. of *dirigere* to set straight, direct, guide — more at DRESS] *vt* **1 a** *obs* : to dedicate to a person **b** *obs* : to write to a person **c** : to mark or label the outer surface of (a message or package to be delivered) with the name and residence or place of business of the intended recipient : SUPERSCRIBE **d** : to supply with a heading, statement, or other indication of a specific addressee or desired recipient ⟨the auditors' certificate ~*ed* to the stockholders⟩ **e** : to impart orally ⟨the speaker ~*ed* a side remark to the gallery⟩ **f** : to adapt and arrange in expression so as to have particular applicability or appeal : ANGLE — used with *to* or *at* ⟨a lawyer who ~*s* his appeals to intelligence and character⟩ **2** : to cause to turn, move, or point undeviatingly or to follow a straight course with a particular destination or object in view: **a** : to dispatch, aim, or guide usu. along a fixed path ⟨X rays are ~*ed* through a portion of the body⟩ ⟨wavelengths ~*ed* to southeast Asia⟩ ⟨sensitivity to humor ~*ed* toward himself⟩ ⟨to Peru was ~*ed* one of the main currents of Spanish colonial conquest —P.E.James⟩ ⟨that Locke's influence upon his successors was primarily to ~ them to empiricism —J.W.Yolton⟩; *also* : ASSIGN, ALLOT ⟨many industries ~ part of their earnings to academic scholarship funds⟩ **b** : to devote with concentration — used usu. with *to* or *toward* ⟨has he found that he must have someone else toward whom he can ~ his mind and in whom he can expand himself —H.A.Overstreet⟩ ⟨~*ing* their whole attention toward the international conflict⟩ **c** : to aim fixedly : concern or involve oneself primarily or totally with — used with *to* or *toward* ⟨ecclesiastical policy was ~*ed* primarily toward the liberation of the church from the fetters of secular interest and state expediency —H.D.Hazeltine⟩ ⟨applied research may be defined as research ~*ed* to the end of reducing the degree of empiricism in a practical art —J.B.Conant⟩ **d** : to point, extend, or project esp. upward or downward ⟨in these mammoths the tusks are vertically ~*ed* at their bases —A.S.Romer⟩ **e** : to engage in or launch hostilely : FOCUS — used with *against* or *at* ⟨our policy is not ~*ed* against any country or doctrine but against hunger, poverty, desperation, and chaos —G.C. Marshall⟩ ⟨if atomic or biological warfare should be ~*ed* against us⟩; *also* : to institute for possible launching or application ⟨binding agreements of a much more specific character ~*ed* at a potential aggressor —Vera M. Dean⟩ **3** : to show or point out the way for ⟨a guide ~*s* tourists to the marine museum⟩ ⟨the map ~*s* us to the left⟩ **4** : to regulate the activities or course of: **a** : to guide and supervise ⟨~*ed* the floor strategy in the House of Representatives⟩ ⟨the archaeologist ~*ing* the excavations⟩; *specif* : to carry out the organizing, energizing, and supervising of esp. in an authoritative capacity ⟨~*ed* the building and arming of an underground network⟩ ⟨not only public propaganda, but also cultural infiltration, is ~*ed* from the same source —A.T.Bouscaren⟩ **b** : ADMINISTER, CONDUCT ⟨ably ~*ed* music and language departments⟩ ⟨while in office he ~*ed* vigorous prosecutions of racketeers⟩ **c** : to dominate and determine the course of ⟨will not find it preposterous that the past should be altered by the present as much as the present is ~*ed* by the past —T.S.Eliot⟩ **d** : to assist by giving advice, instruction, and supervision ⟨the major professor ~*s* graduate students' thesis research⟩; *specif* : to lend a refining, cultivating, or inspiring influence to ⟨~ American taste and mold the genius of the young republic —Van Wyck Brooks⟩ **e** : to train and lead performances of (a musical or dramatic aggregation); *also* : to lead a group in presenting (a ballet, opera, concert, play, or motion picture) **5 a** : to request or enjoin esp. with authority ⟨the judge ~*ed* the clerk to pass him the paper⟩ ⟨the resolution ~*ed* the commission to prepare proposals⟩ ⟨I ~ my executors to present my library intact to my alma mater⟩; *also* : to issue an order to ⟨Lee ~*ed* Jackson to make a wide march to the southwest —T.R.Hay⟩ **b** : to prescribe esp. by formal or mandatory instruction or legal enactment ⟨a court order ~*ing* that the person be brought to a court hearing⟩ ⟨postal inspectors ~*ed* destruction of the obscene matter⟩ ~ *vi* **1** : to point out, prescribe, or determine a course or procedure ⟨however chance shall ~⟩ ⟨the ~*ing* agencies of society — the family, the city, the church, the school, the workshop, and above all the state —J.M.Cameron⟩ ⟨the old theological notion that there is in the universe besides ourselves some ~*ing* power that means well by us —J.W.Beach⟩ **2** : to direct an orchestra or chorus or a dramatic group or performance ⟨equally clever at composing and ~*ing*⟩

syn ADDRESS, DEVOTE, APPLY: these four verbs have in common a reflexive use signifying to turn or bend one's attention, energies, or efforts to something. DIRECT and ADDRESS are not significantly different; one can *direct* or *address* oneself to a task, to one's work, or to the study of something; one can *direct* or *address* one's attention, one's remarks, one's writings to something or someone. DIRECT may possibly stress more an aim or intent, ADDRESS more an appeal to or claim upon attention or interest ⟨asked myself to what purpose I should *direct* my energies —M.R.Cohen⟩ ⟨to *direct* my endeavors . . . toward the object of my search —Mary W. Shelley⟩ ⟨speakers *addressed* themselves to a common question —H.W.Sams⟩ ⟨a story *addressed* not only to one's sense of excitement and the exotic but also to his sense of honor and humanity —Charles Lee⟩ DEVOTE often adds the implication of persistence or of personal dedication ⟨at Cornell he *devoted* himself primarily to his studies and to athletics —*Current Biog.*⟩ ⟨*devoted* himself chiefly to the affairs of this school for the next eight or ten years of his life —S.P.Chase & R.E.Ham⟩ APPLY stresses often an intentional turning of the attention or energies, often a concentration or concentrated application; one APPLIES oneself to a task when, after consideration, he determines upon doing the task, or when he directs his whole attention to it, esp. for some time ⟨he cannot *apply* himself to study —Charles Clairmont⟩ ⟨after having received a careful education . . . he *applied* his attention to practical military subjects —*Encyc. Americana*⟩ **syn** see in addition COMMAND, CONDUCT

²di-rect \də'rekt *also* (ˈ)dī¦r-, *rapid* 'dre-; *after a monosyllabic prefix* -dī- *occurs less often than in other environments, pronunciations like* dī¦rektə'nində,rekt (*"direct and indirect"*) *being frequent*\ *adj sometimes* -ER/-EST [ME, fr. L *directus* straight, direct, fr. past part. of *dirigere*] **1 a** : proceeding from one point to another in time or space without deviation or interruption : not crooked, oblique, reflected, refracted, or circuitous ⟨~ blows of the gavel⟩ ⟨disintegrated by the ~ heat⟩ ⟨exposed to the ~ force of the hurricane⟩ **b** : leading by the short or shortest way to a point or end ⟨a ~ route⟩ ⟨~ means⟩ ⟨~ rays⟩ ⟨~ and speedy passenger service to the coast⟩ **c** *obs* : moving or extending at a right angle to a surface ⟨a ship needs a ~ wind to enter⟩ **d** : transmitted back and forth without an intermediary ⟨engaged in a ~ exchange of recriminations⟩ ⟨no ~ communication with the flooded area⟩ **e** : assigned in the postal service for separate delivery to a particular addressee rather than routed according to street address ⟨a letter deposited in a ~ pouch⟩ **f** : capable of being allocated to a particular portion or process of an undertaking and so treated in cost accounts; *specif* : chargeable to a particular job — compare DIRECT COST, DIRECT LABOR **2 a** : operating or guided without digression or obstruction ⟨while he gives his more ~ attention to something nearer at hand —Nathaniel Hawthorne⟩ ⟨her letters . . . are a ~ reflection of her personality —R.A.Hall b.1911⟩ ⟨~ expansion of consumption is of utmost urgency —*New Republic*⟩ **b** : stemming immediately from a source ⟨having no ~ authority over factory employment policies⟩ **c** : being or passing in a straight line of descent from parent to offspring : LINEAL ⟨only a collateral relative, not his ~ ancestor⟩ ⟨the examiner should not overvalue the influence of ~ heredity —H.G.Armstrong⟩ **d** : clear-cut and distinctive : having no compromising or impairing element : GENUINE, OUT-AND-OUT ⟨an undertaking having a ~ social purpose⟩ ⟨the soldier's pleasures are simple and ~ —Fred Majdalany⟩ ⟨hoping to avoid ~ involvement in the war⟩ **e** : blunt and unqualified : delivered point-blank : CATEGORICAL ⟨his petition for a salary increase was met with a ~ rebuff⟩ ⟨get back to your post. That's a ~ order —Irwin Shaw⟩ ⟨evidence from original documents of the dark ages often give the lie ~ to sentimental novelists⟩ **f** *cryptanalysis, of alphabetic sequences* : arranged or employed in traditional order : not reversed **3 a** : characterized by or giving evidence of a close esp. logical, causal, or consequential relationship ⟨there is a ~ personal tie which assures the beginning of real understanding between individuals —D.J.Shank⟩ ⟨most scientific discoveries now have a ~ bearing on security⟩ ⟨for 20 years in ~ association with the library⟩ ⟨a hundred different complications in which we shall have a ~ interest —F.D. Roosevelt⟩ **b** : INEVITABLE, UNEQUIVOCAL ⟨one ~ result of improving the living conditions was a rise in the birthrate⟩ **c** : serving to get to the point : EFFECTIVE ⟨raising funds would be a ~*er* way of helping the cause⟩ **d** : communicating explicitly often with brusqueness : going straight to the point ⟨before any inquiry so ~ as to demand a positive answer was addressed to her —Jane Austen⟩ ⟨keeps the play ~, uncluttered, and so brisk that the long and familiar story does not make martyrs of its audience —Henry Hewes⟩ ⟨her choreography is ~, nowhere obscured by extraneous devices⟩ **e** : frank, natural, and positive : STRAIGHTFORWARD ⟨a charming, lively person who had a ~ mind, said what he thought and believed others did the same —*Times Lit. Supp.*⟩ ⟨that one's relations with others should be ~ and not diplomatic —A.C.Benson⟩ ⟨it often told you a great deal that was both too ~ and too elusive for words —Willa Cather⟩ **f** *of the object of a verb* : being the one that is the primary goal of an action ⟨*him* in "I saw him" and *me* in "he hit me" are ~ objects⟩ or that results from an action ⟨*a house* in "we built a house" is the ~ object⟩ **4** : marked by absence of an intervening agency, instrumentality, or influence : IMMEDIATE: **a** : made, carried on, or effected without any intruding factor or intervening step ⟨~ loans⟩ ⟨relying less and less on ~ observation of nature —Eric Newton⟩ ⟨some ~ borrowing of Anglo-Norman into English⟩ ⟨until the breaking off of ~ negotiations⟩ **b** : effected by the votes of the people or the electorate and not by representatives ⟨elected for 7 years by ~ suffrage —*Statesman's Yr. Bk.*⟩ ⟨institutions of ~ democracy — popular initiative, the referendum, and the recall —C.A.M.Ewing⟩ ⟨the ~ election of senators —E.P.Herring⟩ **c** : unhampered by divergent, intervening, or separative forces ⟨he had more ~ access to the governor than the legislators⟩ ⟨prefer the more ~ American approach to human problems —David Daiches⟩ **d** : effected by one object or substance in contact with another with no insulating or obstructing element between ⟨~ contact with another metal must be avoided⟩ ⟨there is no ~ connection between the apartments⟩ **e** : consisting of or reproducing the exact words of a real or supposed original speaker ⟨the words in quotation marks in the sentence *He said, "I can come"* are ~ quotation⟩ ⟨~ discourse⟩ **f** (1) : being without intermediate logical steps ⟨~ proofs⟩ (2) : independent of intermediate representations, percepts, images, or sense data ⟨~ knowledge of things⟩ **g** : not requiring an intermediate host for completion : MONOXENOUS — used of the life cycle or development of a parasitic organism **h** : capable of dyeing without the aid of a mordant : SUBSTANTIVE — see DIRECT DYE **5 a** : experienced personally without associative effort of anyone else ⟨his account of the battle contains much ~ evidence⟩ ⟨whereas to conceal ~ pain was a virtue, to conceal vicarious pain was a sin —Jan Struther⟩; *specif* : FIRSTHAND ⟨from ~ experience with youngsters at camp⟩ **b** : active, personal, and responsible ⟨taking ~ charge of the distribution of relief funds⟩ ⟨the ordinary worker has a ~ part in the production process⟩; *specif* : not deputed or to be deputed ⟨few were willing to assume ~ responsibility⟩ **6 a** *of a celestial body* : moving in the general planetary direction from west to east : not retrograde **b** *of a binary star* : following the direction of increasing position angle : COUNTERCLOCKWISE **7** *of a sundial* : having a vertical face and facing squarely toward one of the cardinal points of the compass

³di-rect \də'rekt *also* dī'-, *rapid* 'dre-\ *adv* [ME, fr. *direct*, adj.] : in a direct way: **a** : from point to point without deviation : by the short or shortest way ⟨by helicopter it is now possible to go ~ from port to airport in forty minutes —Ivor Jones⟩ ⟨despatching individual books ~ to individual teachers —James Britton⟩ **b** : from the source or the original without interruption or diversion ⟨broadcast ~ from ringside⟩ ⟨the writer must take his material ~ from life —Douglas Stewart⟩ **c** : mechanically joined or in mesh : mechanically or electrically in contact ⟨*direct*-controlled by the helmsman⟩ **d** (1) : without any intervening agency or step : without any intruding or diverting factor ⟨some enter a career ~ from college⟩ ⟨refusal to negotiate ~ with the puppet regime⟩; *specif* : without use of a broker or other middleman ⟨butter that is sold ~ without going through the exchanges —Geoffrey Shepherd⟩ (2) : EXPLICITLY, UNEQUIVOCALLY ⟨the right information ~ from his office⟩ ⟨in reporting news the television camera brings the event and the personalities ~ to the public —*Collier's Yr. Bk.*⟩ (3) : VERBATIM ⟨translated ~ from the Russian text⟩

⁴direct \"\ *n* -s [²*direct*] **1** : a character sometimes put at the end of a musical staff or page of music on a line or space corresponding to the position of the first note of the next staff as a warning to the performer — called also *custos* **2** : a direct package of postal matter

di-rect-able \də'rektəbəl *also* dī'-, *rapid* 'dre-\ *adj* : capable of being directed

direct-acting \¦=¦=¦==, ¦=,=¦==\ *adj* : involving direct action without the intervention of other working parts ⟨*direct-acting* engine⟩ ⟨*direct-acting* pump⟩

direct action *n* : action that seeks to achieve an end directly and by the most immediately effective means as opposed to the use of diplomatic exchange or negotiation; *specif* : action by organized labor to obtain ends by means of boycott, sabotage, or striking — contrasted with *political action*

direct bearing *n* : direct vertical support for any structural element in a construction

direct black *n* : any of various direct dyes that dye cotton black — see DYE table I

direct cell division *n* : AMITOSIS

direct cerebellar tract *n* : a tract of fibers in the posterior lateral part of the spinal cord that is external to the crossed pyramidal tract, that arises from the cells of the nucleus dorsalis, and that passes through the restiform body of the medulla to the cerebellum

direct-connected \¦=¦==¦==, ¦=,==¦==\ *adj, of machines* : being on a common shaft : DIRECT-COUPLED

direct contempt *n* : a contempt occurring in the presence of a court in session or so near as to interfere with the administration of justice or in the presence of a judge acting in a judicial capacity; *also* : a contempt directly obstructing a legislative body in the actual exercise of its lawful legislative powers — compare CONSTRUCTIVE CONTEMPT

direct control *n* : a control that is directly imposed upon the manufacturing, pricing, and distribution of specific goods in contrast with an indirect or general control (as a credit and fiscal policy) that affects the economy in its entirety and specific goods only indirectly

direct cost *also* **direct charge** *n* : a cost that may be computed and identified directly with a product, function, or activity and that usu. involves expenditures for raw materials and direct labor and sometimes specific and identifiable items of overhead — contrasted with *indirect cost*

direct-coupled \¦=¦=¦==, ¦=,=¦==\ *adj* **1** *of belting or gearing* : coupled without intermediate connections **2** *of an electric circuit* : having conductive rather than inductive or capacitive coupling

direct current *n* : an electric current flowing in one direction only and substantially constant in value — abbr. *D.C.*; compare ALTERNATING CURRENT

direct deep black EW *n, usu cap both Ds&B* : a trisazo dye derived from benzidine and used esp. for dyeing cotton and leather and as a biological stain — called also *chlorazol black E, direct black EW*; see DYE table I (under *Direct Black 38*)

direct democracy *n* : DEMOCRACY 1b(1)

direct development *n* : development without a metamorphosis

direct distance dialing *n* : the dialing of a telephone number outside the local calling area by using initial code numbers to make a direct connection — abbr. *DDD*

direct drive *n* : a drive whose driving and driven parts are direct-connected

direct-driven \¦=¦=¦==, ¦=,=¦==\ *adj* : driven by another machine to which it is direct-connected

direct dye *n* : a water-soluble dye usu. of the azo class that is used in alkaline or neutral solution esp. for dyeing cellulosic material (as cotton or paper) directly — see DYE table I

directed *adj* [fr. past part. of ¹*direct*] **1** : having a positive or negative sense — used of a line segment or vector **2** : subject to regulation by a guiding and supervising agency ⟨a ~ economy that would permit an increased volume of capital investments on the part of the state —C.A.L.Rich⟩ ⟨a ~ study program for gifted children⟩

di-rect-ed-ly *adv* : under guidance and supervision

di-rect-ed-ness *n* -ES : subjection to a guiding or motivating influence ⟨the interplay within the individual of these two ~*es* —Adam Curle⟩

directed number *n* : a number preceded by a plus or minus sign

directed verdict *n* : a verdict that the jury is instructed by the court to find when the facts proved do not admit in the court's opinion of any reasonable doubt

di-rect-ee \də,rek'tē, dī¦r-, ¦dī,rek¦-\ *n* -s [¹*direct* + *-ee*] : one who receives direction

directer *comparative of* DIRECT

directest *superlative of* DIRECT

direct evidence *n* : evidence that if true immediately establishes the fact to be proved by it

direct examination *n* : the first examination of a witness in the orderly course by the party calling him and upon the merits

direct exchange *n* : FIXED EXCHANGE

direct finder *n* : DIRECT VIEWFINDER

direct fire *n* [¹*direct* + *fire*, v.] : gunfire by direct aiming on a visible target

direct-fire \¦=¦=¦=, ¦=,=¦=\ *vt* : to fire without provision for preheating the air or gas ⟨some furnaces are *direct-fired*⟩

direct-geared \"\ *adj* : connected for power transmission by a gear on the power shaft of one machine meshing with a gear on the driving or following shaft of another machine

direct grant school *n, in England & Wales* : a private secondary school that receives a direct grant from the ministry of education and in return binds itself to obey certain conditions with reference to admission of pupils

directing *pres part of* DIRECT

directing piece *n* : BASE PIECE

direct initiative *n* : the legislative initiative where a proposed measure is submitted directly to the voters — distinguished from *indirect initiative*; compare INITIATIVE 3b

direct investment *n* : investment of capital in physical assets or in ownership of a whole enterprise — contrasted with *portfolio investment*

¹di-rec-tion \də'rekshən *also* dī'-, *rapid* 'dre-\ *n* -s [MF & L; MF, fr. L *direction-*, *directio*, fr. *directus* (past part. of *dirigere* to direct, guide) + *-ion-*, *-io* -ion — more at DRESS] **1 a** : guidance or supervision of action, conduct, or operation ⟨the whole system of life had its culmination in the church; and parson and squire presided over its ~ —C.E.Raven⟩ ⟨under whose ~ this paper was written⟩ ⟨the doctrine that government should move forward toward ~ of the economy⟩; *specif* : chief executive function ⟨he was put in charge and given overall ~ of the program⟩ **b** : the art and technique of directing a stage play, a motion picture, or a television program consisting of the selection of the effects to be produced, the means to produce these effects, and the management and training of the cast **c** : the art and technique of directing the performance of an orchestra, opera, or concert or of a chorus or other musical group ⟨the musicianly ~ . . . helped illumine the score —Miles Kastendieck⟩ **d** : a word or phrase usu. in Italian or a sign indicating the appropriate tempo, mood, or intensity of a passage or movement in a musical score **2** *archaic* : the address placed on the outside of a letter or package to be delivered : SUPERSCRIPTION ⟨pray send me Grandmamma's ~, I must write to her —W.M.Thackeray⟩ **3 a** : something that is imposed as authoritative instruction or bidding ⟨the senate had been voting according to ~ for so long that they seemed to have lost the power of independent decision —Robert Graves⟩ ⟨he gave orders all round and men quickly obeyed—relieved at ~ —Harris Downey⟩ **b** : an explicit instruction : ORDER, COMMAND ⟨a report prepared at the ~ of the president⟩ — often used in pl. ⟨the author's stage ~*s* to actors and cameramen⟩ ⟨~*s* appear on the package⟩ **c** : the charge or instruction given on a point of law by a judge to a jury **4** *obs* : administrative capacity **5 a** : the property of space by which given two positions others may be generated or determined in the same dimension and relation, the aspect of progression being usu. implicit **b** : the line or course on which something is moving or is aimed to move or along which something is pointing or facing ⟨the ~ of a current is that toward which the water moves, which is the reverse of the way winds are named —G.W.Mixter⟩ ⟨follow the ~ of the arrow⟩ **c** : a line or course extending away from a given point through space and often designated by the point of the compass toward which it extends ⟨from the tower sweeping views in all ~*s*⟩ ⟨below the falls the river meanders in a southeasterly ~⟩ **d** : the shortest path toward the vicinity or source — used in the expression *in the direction of* ⟨throwing grenades in the ~ of the voices⟩ **e** : a position on a line extending through space toward a point of the compass ⟨from what ~ will the attack come⟩ ⟨protests poured in from all ~*s*⟩; *also* : a point of view or an angle from which something may be considered ⟨the three authors attack the same subject from three different ~*s*⟩ **f** : the angle between a true north-south line passing through the position of the observer and a great circle passing through both this position and a given point on the surface of the earth : BEARING **g** : the path of either the longest straight line that can be drawn along a sheet or band of paper or a straight line crossing this at right angles from edge to edge **6 a** : a channel or direct course of thought or action ⟨the outbreak of war gave another ~ to his activities⟩ ⟨the ~*s* in which voters can express their will are limited⟩ ⟨with business expanding in all ~*s*⟩ **b** : a course of progress, development, or evolution showing a distinct tendency or trend ⟨his latest

beard on the human face (a slender lad with just a trace of ~ on his cheeks); *also* : fine soft hair elsewhere on the body (tanned arms lightly covered with a silvery ~) **b** : the pubescence of a plant (wipe the ~ off the peaches); *also* : a soft tuft (as a coma or pappus) on some plant part **c** : soft fur fiber usu. from the undercoat of an animal **d** : a fine powdery coating or surface (a ~ of crystals) — **in the down** *of a young bird* : covered with down

4**down** \"\ *vt* -ED/-ING/-S : to cover, ornament, line, or stuff with down : make downy (a mouse ~*ed* in its winter coat —Herbert Gold)

5**down** \"\ *adj, usu cap* [fr. *Down*, county of Northern Ireland] : of or from County Down, Northern Ireland : of the kind or style prevalent in County Down

dow·na \ˈdau̇nə\ [*dow* + *na*] *chiefly Scot* : CANNOT

down–along \ˈ-,-\ *adv, dial* : down the length of something (as a coast or road) : to or at a point in the distance

1**down–and–out** \ˈ-,-\ *adj* [*down* + *and* + *out*, adj.] **1** : so weakened, disabled, or incapacitated as to be ineffective : broken in health **2** : suffering irrecoverably from financial losses or deficiencies **3** *of a boxer* : so broken down by past beatings as to be incompetent as a pugilist

2**down–and–out** \"\ *n* -s [1*down-and-out*] **1** *also* **down–and–out·er** \-ə(r)\ [*down-and-outer* fr. 1*down-and-out* + -*er*] : a person who is down-and-out **2** : the play or discard in bridge of a high card of a nontrump suit followed by a lower card of the same suit to indicate ability to trump if a third round of the suit is led

down–at–heel \ˈ-,-\ *or* **down–at–the–heel** \ˈ-,-\ *also* **down–at–heels** \ˈ-,-\ *or* **down–at–the–heels** \ˈ-,-\ *adj* : marked by a slovenly slipshod condition or having a threadbare faded appearance : SHABBY (loneliness gnawed at the lives of all the guests in . . . a *down-at-the-heel* private hotel in an English seaside town —Pamela Taylor) (occurred to him that he was *down-at-heel*, dingy —Martha Gellhorn) (should have to pass the hat round or try (dressed like a *down-at-heels* corner boy) to get some sort of job —Nicholas Monsarrat)

downbear \(ˈ)-,-\ *vt* [ME *dounberen*, fr. *doun* down + *beren* to bear, carry — more at DOWN, BEAR] *archaic* : to bear down : DEPRESS : press upon

1**downbeat** \ˈ-,-\ *n* **1** : the downstroke of the conductor indicating the first stressed beat of a musical composition; *also* : any first beat : THESIS **2** : an ictus or arsis : STRESS **3** : a decline in activity or prosperity : depressed condition

2**downbeat** \"\ *adj* : PESSIMISTIC, GLOOMY, UNHAPPY (a movie with a ~ ending)

down–beater \ˈ-,-\ *n* [1*down* + *beater*] : a rotating device used on a combine to beat down the moving grain and help to feed it uniformly to the cylinder

downbend \ˈ-,-\ *n* : a depression (as in the bed of the sea) due to downward bending of the earth's crust

downbent \ˈ-,-\ *adj* : bowed or drawn downward (~ trees marked the path of the storm) (a tired ~ old man)

downbound \ˈ-,-\ *adj* : heading or leading in any direction that is conventionally down (a ~ channel) (~ traffic)

down–bow \ˈ-,bō\ *n* : a stroke in playing a bowed instrument (as a violin) from the heel toward the point of the bow — contrasted with *up-bow*; symbol ∧ or ⊓

downbuckle \ˈ-,-\ *n* : a generally long and relatively narrow portion of the earth's crust that has been bent sharply downward — **downbuckling** \ˈ-,-(-)-\ *n*

down–budding \ˈ-,-\ *n* : a method of budding in which the scion is inserted in an inverted position

downbye *also* **downby** \(ˈ)dün;bī\ *adv* [1*down* + *by*, adv.] *Scot* : down that way : down below

down calver *n* [1*down* + *calve* + -*er*] *Brit* : a down-calving cow

down–calving \ˈ-,-\ *adj* [1*down* + *calving*, fr. pres. part. of *calve*] *Brit* : nearly ready to calve

down card \ˈ-,-\ *n* **1** : a card dealt face down in any card game in which certain other cards are dealt face up **2** : a card that is part of a player's hand but is left face down on the table while other of his cards are exposed **3** : HOLE CARD

1**downcast** \(ˈ)-,-\ *vt* [ME *downcasten*, fr. *doun* down + *casten* to cast — more at DOWN, CAST] *archaic* : OVERTHROW, DEMOLISH; *also* : DEJECT

2**downcast** \ˈ-,-\ *n* [ME *downcast*, fr. *downcasten*, v.] **1** : a casting down : OVERTHROW **2** : a *downcast* or melancholy glance or appearance **3** : a ventilating shaft down which fresh air passes in circulating (as through a mine or the hold of a ship); *also* : the current of air through the shaft

3**downcast** \ˈ-,-\ *adj* [fr. past part. of 1*downcast*] **1** : low in spirit : DEPRESSED, DISPIRITED, DEJECTED **2** *of looks* : cast downward : directed to the ground (as from bashfulness modesty, dejection, or guilt) **3** : having a downward draft (a ~ mine shaft)

syn DISPIRITED, DEJECTED, DEPRESSED, DISCONSOLATE, WOEBEGONE: DOWNCAST suggests utter lack of cheer, confidence, and hope, perhaps accompanied by shame, chagrin, or bashfulness (their smiling faces became *downcast*, their eyes held a look of furtiveness and uneasiness —Francis Birtles) DISPIRITED indicates low-spiritedness and discouragement, usu. after failure or disappointment (they could make no impression, and fell back at daybreak beaten and *dispirited* —J.A.Froude) (a fragile, *dispirited* gentlewoman who appeared to find everything in the world immeasurably sad and who spoke mostly in the past tense —Jean Stafford) DEJECTED may imply more utter lowering of spirits and remarkable loss of hope, courage, and strength (timorous and *dejected*, apprehending themselves to be haunted and possessed with vengeful spirits —William Bartram) DEPRESSED implies a sinking under heavy burdens, often economic ones; it may describe chronic underprivilege or indicate psychological incapacity for hope, gladness, or even purposive activity (the *depressed* populations of the ghettos of the Middle East and North Africa —John Hersey) (*depressed* by his failures and contemplating suicide) (*depressed* and stolid after the manic phase) DISCONSOLATE describes one so utterly dispirited that he cannot be consoled, comforted, or encouraged (the Jews sat *disconsolate* on the poop; they complained much of the cold they had suffered —George Borrow) (the *disconsolate* frown of a hunter who has seen nothing but warblers all day —James Thurber) WOEBEGONE describes the appearance of dejection and defeat, sometimes lugubrious (officers, seamen, and prisoners alike, we were as gaunt and *woebegone* a crowd as had ever been cast ashore from a shipwrecked vessel —C.B.Nordhoff & J.N.Hall)

down·cast·ness *n* -ES : the quality or state of being downcast

down·come \ˈdau̇n,kəm\ *n* -s [ME (Sc) *downcome*, fr. ME *doun* down + *come* action of coming, alter. (influenced by *comen* to come) of *kime*, fr. OE *cyme*, fr. *cuman* to come — more at DOWN, COME] **1** *archaic* : a coming down : DESCENT : sudden fall : DOWNFALL : OVERTHROW **2** : DOWNCOMER a

downcomer \ˈ-,-\ *n* [1*down* + *comer*] : a pipe to conduct something downward: as **a** : a pipe for leading the hot gases from the top of a blast furnace downward to the dust collectors and flue system — see BLAST FURNACE illustration **b** : a tube larger in diameter than the water tubes in some watertube boilers to conduct water from each top drum to a bottom drum under the influence of thermal circulation

downcountry \ˈ-,-\ *adv (or adj)* [1*down* + *country*] : in, toward, or of the seaboard or peripheral regions of an area

downcourt \ˈ-,-\ *adv (or adj)* : in or into the direction of the goal (as in basketball)

downcry \(ˈ)-,-\ *vt* : to cry down : DISPARAGE

downcurved \ˈ-,-\ *adj* : curved downward esp. at the end — used of projecting parts (the long ~ bill of the curlew)

downcut \(ˈ)-,-\ *vb* : to cut down or downward by or as if by erosion — used chiefly as a present participle and esp. in distinguishing between downward and lateral stream erosion

downdale \ˈ-,-\ *adv* : DOWNHILL

downdraft \ˈ-,-\ *n* -s *often attrib* : a downward current of air or other gas (as in a mine shaft, kiln, or carburetor or during a thunderstorm)

down east \(ˈ)-,-\ *adv (or adj), often cap D&E* : in or into the northeast coastal section of the U.S. and parts of the Maritime Provinces of Canada; *specif* : in or into coastal Maine

down east·er \dau̇ˈnēstə(r)\ *n, often cap D&E* **1** : one born or living down east **2** : a ship built down east; *esp* : a sailing ship from Maine

downed *past of* DOWN

down·er \ˈdau̇nə(r)\ *n* -s [4*down* & 4*down* + -*er*] : one that downs or that takes, brings, gets, or puts down; *esp* : a weak, sick, or crippled animal in a shipping load that is down and unable to rise

downface \(ˈ)-,-\ *vt* [1*down* + *face*, v.] : CONTRADICT

down–faced \ˈ-,-\ *adj* : having a continuous slope from forehead top to end of muzzle or bill with little or no stop — used of domestic mammals and birds; compare DISH-FACED

downfall \ˈ-,-\ *n* -s [ME *downfal*, fr. *doun* down + *fal* fall — more at DOWN, FALL (noun)] **1 a** : a sudden fall from high estate, power, reputation, or happiness : DESTRUCTION, RUIN (the ~ of the government) **b** : a fall (as of snow or rain) esp. when sudden or heavy : DESCENT **2 a** *archaic* : a precipitous descent : ABYSS **b** : a trap having some device that falls and imprisons or injures the prey when the trap is sprung — compare DEADFALL **c** : something that causes a downfall (as of a person) (drink was his ~)

downfallen \ˈ-,-\ *adj* [1*down* + *fallen*] : FALLEN, RUINED

downfalling \ˈ-,-\ *adj* [1*down* + *falling*, adj.] *archaic* : falling down : DECAYING

downfaulted \ˈ-,-\ *adj* [1*down* + *faulted*, fr. past part. of *fault*] *of a geological formation* : lowered by faulting

downfield \ˈ-,-\ *adv (or adj)* [1*down* + *field*] : in or into the part of a football field beyond the line of scrimmage toward the opposing team's goal (a play should be planned to allow the ends to get ~ if needed) (effective ~ blocking)

downflow \ˈ-,-\ *n* : a downward flow or something that flows down; *esp* : a downward flowing current of air

downflowing \ˈ-,-\ *adj* : running or cascading down

downfold \ˈ-,-\ *n* : SYNCLINE — **downfolded** \ˈ-,-\ *adj*

down–gone \ˈdau̇n,gȯn *also* -gän\ *adj* [prob. alter. (influenced by 1*down* and *gone*, past part. of *go*) of 1*doggone*] *dial* : in poor condition : DISTRESSED; *often* : DARNED, DOGGONE

1**downgrade** \ˈ-,-\ *n* [1*down* + *grade*, n.] **1** : a downward grade (as of a road) **2** : a descent toward an inferior state : DETERIORATION — used esp. in the phrase *on the downgrade*

2**downgrade** \ˈ-,-\ *adv (or adj)* : DOWNHILL (the road dips ~) (the crossing where the ~ freights hit so many buggies and teams —Wright Morris)

3**downgrade** \(ˈ)-,-\ *vt* [1*down* + *grade*, v.] **1** : to minimize or depreciate in grade (the folly of *downgrading* Soviet technology) (those countries preparing to ~ their commitments to NATO) **2 a** : to lower the market class of (as grain or produce) esp. because of impurities or defects (several carlots of wheat were *downgraded* for excessive cockle) **b** : to alter the status of (a workman or his job) so as to lower the rate of pay (older workers may often be kept employed by *downgrading* them to jobs that they are still able to handle) (any major shift in production or methods is likely to require extensive *downgrading* of jobs) **3** : to assign (as a document) to a less restricted classification of security

downgrowth \ˈ-,-\ *n* : the growing downward of a structure; *also* : the product of such growth

down–gyved *adj* [1*down* + *gyved*, fr. past part. of *gyve*] *obs* : hanging down like gyves

downhand \ˈ-,-\ *adj* [prob. fr. 1*down* + *hand*, n.] *of welding* : performed from the upper side of the joint with the face of the weld approximately horizontal

downhaul \ˈ-,-\ *n* [1*down* + *haul*, v.] : a rope or line for hauling down or holding down a sail or spar (a staysail ~)

downhearted \ˈ-,-\ *adj* : DEJECTED — **down·heart·ed·ly** \(ˈ)-,-\ *adv*

down·heart·ed·ness *n* -ES : the quality or state of being downhearted

1**downhill** \ˈ-,-\ *n* [1*down* + *hill*] **1 a** *archaic* : the slope toward the bottom of a hill : DECLIVITY, DESCENT **b** : a descending gradient (as in circumstances or human existence) (the tragic ~s that bring many promising careers to an end) **2** [3*downhill*] : a competitive ski event consisting of skiing down a trail against time

2**downhill** \ˈ-,-\ *adv* [1*down* + *hill*] **1** : toward the bottom of a hill (traveling ~ we really got up speed) **2** : toward a lower, poorer, or inferior state or level — used esp. in the phrase *go downhill* (the town has gone ~ since the mill closed) (after he retired he went ~ very rapidly)

3**downhill** \ˈ-,-\ *adj* [2*downhill*] **1** : sloping downhill **2** [1*downhill* 2] : of, relating to, or designed for use in skiing downhill (a leading ~ contestant) (attractive ~ trousers)

downhill turn *n* : any skiing turn down the slope from a traverse run

downhold \ˈ-,-\ *n* : an act of minimizing (as of expenses) (a stringent ~ on cable tolls)

down–house \ˈ-,-\ *adv* [1*down* + *house*] *dial Brit* : DOWNSTAIRS

downier *comparative of* DOWNY

downiest *superlative of* DOWNY

down·i·ly \ˈdau̇nəlē, -nilē\ *adv* : in a downy manner : ARTFULLY

down·i·ness \ˈdau̇nēnəs, -ainis-\ *n* -ES : the quality or state of being downy

downing *pres part of* DOWN

dow·nin·gia \dau̇ˈnin(g)ēə\ *n, cap* [NL, fr. Andrew J. *Downing* †1852 Am. horticulturist + NL -*ia*] : a small genus of annual dwarf American herbs (family Lobeliaceae) with alternate leaves and showy sessile flowers having an unsplit corolla tube

down–in–the–mouth \ˈ-,-\ *adj* : DEPRESSED, DOLOROUS

down·land \ˈ-,land\ *n* : 1DOWN 2

down–lead \ˈ-,lēd\ *n* : a radio lead-in

down·less \ˈ-ləs\ *adj* : having or growing no down (a ~ chick)

downlight \ˈ-,-\ *n* : a small spotlight set in the ceiling and directed downward

downline \ˈ-,-\ *adv* [1*down* + *line*, n.] : down the railway line

down lock *n* : a device in an airplane that locks the landing gear in the down position after it has been lowered

down·looked \ˈ-,lu̇kt\ *adj* [1*down* + *look*, n. + -*ed*] *archaic* : downcast in countenance as or as if from guilt : SHEEPISH

downlying \ˈ-,-\ *n* -s [1*down* + *lying*, fr. gerund of *lie*] **1** *now dial Eng* : the time or act of going to bed : time of repose **2** *also* **down·lig·ging** \ˈ-,ligin, -gin\ [*downligging* fr. 1*down* + *ligging*, fr. gerund of *lig*] *chiefly Scot* : LYING-IN

down milling *n* [1*down* + *milling*] : CLIMB MILLING

down–most \ˈ-,mōst *sometimes chiefly Brit* -,məst\ *adv (or adj)* : farthest down

down–ness \ˈdau̇nnəs\ *n* -ES : the state or condition of being down

downpipe \ˈ-,-\ *n, Brit* : DOWNSPOUT

downpour \ˈ-,-\ *n* : a pouring or streaming downward (as of sunlight); *esp* : a heavy drenching

1**downright** \ˈ-,-\ *adv (or adj)* [ME *dounright*, fr. *doun* down + *right*, adv. — more at DOWN] **1** *archaic* : straight down : in a perpendicular course **2** : OUT-AND-OUT, PLAIN, OUTRIGHT (I was ~ ashamed of our party) (a ~ liar); *sometimes* : VERY : to the utmost degree (the sunset was ~ lovely) **3** : without ceremony : with plain blunt honesty : FORTHRIGHT (a ~ answer) (so ~ a moralist) (he was kind but ~) (went ~ to his task) — **down·right·ness** \ˈ-,-nəs\ *n*

2**downright** \"\ *n* : an inferior short-staple wool — usu. used in pl.

down·right·ly \ˈ-,-lē, -li\ *adv* [1*downright* + -*ly*] : in a straightforward or forthright manner : without hesitation

downriver \ˈ-,-\ *adv (or adj)* [1*down* + *river*] : from, toward, or at a point near the mouth of a river (drifted ~ on a raft) (important ~ markets)

downs *pl of* DOWN, *pres 3d sing of* DOWN

down–set \ˈdün,set\ *n* [1*down* + *set*, v.] *Scot* : a provision of money or an establishment; *specif* : MARRIAGE SETTLEMENT

down–sexed \ˈdau̇n,sekst\ *adj* [1*down* + *sexed*] : having sex appeal minimized (*down-sexed* illustrations)

1**downshift** \ˈ-,-\ *vi* [1*down* + *shift*, v.] : to shift an automotive vehicle into a lower gear (~ into low or second gear)

2**downshift** \"\ *n* : a shift into a lower automotive gear

downside \ˈ-,-\ *n* **1** : the under or lower side (a gaily tilted hat with a decorative clasp on the ~) **2** : a trend downward (as of prices) — used chiefly in the phrase *on the downside*

downside up *adv* : TOPSY-TURVY

downsitting \ˈ-,-, *Scot* ˈdün-\ *n* [1*down* + *sitting*, fr. gerund of *sit*] **1** : the action of sitting down : REPOSE **2** *Scot* : DOWNSET

downslide \ˈ-,-\ *n* : a decline to a lower level (as of prices or business)

1**downslope** \ˈ-,-\ *adv* [1*down* + *slope*] : in a downward direction : DOWNHILL (khaki-clad figures . . . sliding ~ toward him —Walt Sheldon)

2**downslope** \"\ *adj* : DOWNHILL, DESCENDING (~ winds) (~ movement of ice)

3**downslope** \ˈ-,-\ *n* [1*down* + *slope*] : DOWNHILL (he had only to remember to keep the ~ on his right —W.V.T.Clark)

downs·man \ˈdau̇nzmən\ *n, pl* **downsmen** [*downs* (pl. of 1*down*) + *man*] : a dweller on the downs

down–some \ˈdau̇n(t)səm\ *adj* : DISPIRITED, DEPRESSED

down south \ˈ-,-\ *adv, often cap S* : in or into a more southerly location (learned about the ways of fish in Canadian waters before he came *down south* —Sydney (Australia) Bull.); *esp* : in or into the southeastern part of the U.S.

downspout \ˈ-,-\ *n* : a pipe leading downward; *esp* : a pipe to carry off rain water from a roof

down's syndrome \ˈdau̇nz-\ *n, cap D* [after J.L.H. *Down* †1896 Eng. physician, who first described it] : MONGOLISM

1**downstage** \ˈ-,-\ *adv (or adj)* [1*down* + *stage*, n.] : toward or at the front of a theatrical stage (swept her train ~) (bent the ~ knee) — compare UPSTAGE

2**downstage** \ˈ-,-\ *n* : the front of a stage immediately behind the footlights

1**downstairs** \(ˈ)-,-\ *adv* [1*down* + *stairs*, pl. of *stair*] **1** : down the stairs : on or to a lower floor **2** *aeronautics* : on, near, or to the ground

2**downstairs** *also* **downstair** \ˈ-,-\ *adj* **1** : situated on the main, lower, or ground floor of a building **2** : placed at or occupying a lower level (the ~ television channels)

3**downstairs** \(ˈ)-,-\ *n pl but sing or pl in constr* **1** : the part of the house belowstairs : the lower floor or floors **2** : persons occupying the lower part of a building; *often* : the servants of a household (~ were shocked at such goings on)

downstart \ˈ-,-\ *n* [1*down* + -*start* (as in *upstart*)] : an Irishman of good birth and upbringing but with little fortune; *often* : a younger son of good family

1**downstate** \ˈ-,-\ *adv (or adj)* [1*down* + *state*, n.] **1** : into or in a part of a state designated as downstate (the voting was light ~) **2** : characteristic of a part of a state designated as downstate (peculiarities of ~ pronunciation)

2**downstate** \"\ *n* : the more southerly part of a state of the U.S. as distinguished from a northerly part conventionally designated as *upstate* — **down·stat·er** \ˈ-ˈstād-ə(r)\ *n* -s

downstream \ˈ-,-\ *adv (or adj)* [1*down* + *stream*, n.] : down a stream : in the direction of flow of a stream

downstreet \ˈ-,-\ *adv* [1*down* + *street*, n.] : to, toward, or in the main retail business section of a town (going ~ after supper)

downstroke \ˈ-,-\ *n* **1** : a stroke (as of a piston in a cylinder or of a conductor's baton) made in a downward direction **2 a** : a stroke (as of a handwritten cursive letter) commonly written in a downward direction and in some styles heavier than an upstroke **b** : a corresponding stroke of a printed letter

downsun \ˈ-,-\ *adv (or adj)* [1*down* + *sun*, n.] : in a direction from or out of the sun (a ~ attack by an aircraft)

downswing \ˈ-,-\ *n* **1** : a swing downward; *esp* : the forward and downward sweep of a golf club following the backswing **2** : a downward or depressed trend (the ~ in interest in politics) (in the ~ of a cyclic mania); *esp* : the contraction phase of a business cycle

downtake \ˈ-,tāk\ *n* [1*down* + -*take* (as in *intake*)] : a pipe, duct, or flue (as for air, gas, or water) that leads downward

down–the–line \ˈ-,-\ *adv (or adj)* : all the way : to the end (supporting the party ticket right *down-the-line*) (a *down-the-line* union man)

down the river *n, often cap D&R* : SEVEN-CARD STUD

downthrow \ˈ-,-\ *n* **1** : the act or process of throwing down : state of being overthrown : OVERTHROW (the sudden ~ of a reputation) **2** : the side of a geologic fault that moved downward relative to the other side — compare THROW

downthrown \ˈ-,-\ *adj* [1*down* + *thrown*, fr. past part. of *throw*] : thrown down : DEPRESSED

downthrust \ˈ-,-\ *n* : downward movement of an object under impact or steady pressure; *also* : an impact or pressure tending to cause downthrust

downtime \ˈ-,-\ *n* [1*down* + *time*] **1** : time during which a machine, department, or factory is inactive during normal operating hours (as for repairs or setting up or from lack of materials) **2 a** : a period during which an incentive worker is unable to produce because of plant factors beyond his control and therefore receives payment at an agreed base rate **b** : money paid a worker for downtime

down–to–date \ˈ-,-\ *adj* : UP-TO-DATE

down–to–earth \ˈ-,-\ *adj* : practical and straightforward : having no frills or foibles : REALISTIC

down·to·ni·an \(ˈ)dau̇nˈtōnēən\ *adj, usu cap* [*Downton*, town in Wiltshire, England + E -*ian*] : of, relating to, or constituting a subdivision of the European Silurian — see GEOLOGIC TIME table

1**downtown** \ˈ-,-\ *adv (or adj)* [1*down* + *town*] **1** : to, toward, or in the lower part or business center of a city (this bus goes ~) (delinquents roaming the ~ streets) **2** : relating to or characteristic of the business center of a city (always patronizes the ~ stores)

2**downtown** \"\ *n* : the business center of a city (the ~s of a hundred cities dressed and lighted for Christmas) — **down·town·er** \ˈ-ˈtau̇nə(r)\ *n* -s

down tree *n* [1*down* + *tree*; fr. the thick cottony fibers surrounding the seeds] : BALSA 1

downtrend \ˈ-,-\ *n* : a tendency downward esp. in economic matters (a persistent ~ in sales)

downtrod *obs var of* DOWNTRODDEN

down·trod·den \(ˈ)-ˈträd°n\ *adj* [1*down* + *trodden*, fr. past part. of *tread*] : abused by superior power — **down·trod·den·ness** \-°n(n)əs\ *n* -ES

downturn \ˈ-,-\ *n* **1** : an act or instance of turning down (the ~ of an anticlinal fold —W.Y.Westervelt); *also* : the state of being turned down (the ~ of her mouth became a habit —Dorothy Parker) **2** : DECLINE, DECREASE (a sharp ~ in new construction); *usu* : a downward trend in economic matters (the ~ of prices) (business began to show a ~)

down–twister \ˈ-,-\ *n* : a textile manufacturing machine with downward feeds for plying yarn while adding some twist — compare UP-TWISTER

1**down under** *adv* [1*down* + *under*, adv.; fr. the conception of the antipodes as being located beneath one's feet] : into or in Australia or New Zealand

2**down under** *n, sometimes cap D&U* : ANTIPODE 2

1**down·ward** \ˈdau̇nwə(r)d\ *also* **down·wards** \-dz\ *adv* [*downward* fr. ME *dounward*, fr. *doun* down + -*ward*; *downwards* fr. ME *dounwardes*, fr. *dounward* + -*es* (adverbially functioning gen. sing. ending of nouns) — more at DOWN, -*s*] **1** : from a higher place to a lower : in a descending course (looking ~ to the grass) (the streams roll ~ to the sea) **2** : from a higher to a lower condition (revised his estimate ~) : toward misery, humility, disgrace, or ruin (fell from grace and went ~ in life) **3** : from a remote or earlier time : from an ancestor or predecessor : from one to another in a descending line (prophets from Elijah ~ who preached repentance)

2**downward** \"\ *adj* [ME *dounward*, fr. *dounward*, adv.] **1** : moving or extending from a higher to a lower place : tending toward the earth or its center or toward a lower level (the ~ pull of gravity) **2** : descending from a head, origin, or source (a ~ line of descent) (the ~ course of a stream) **3 a** *archaic* : tending to a lower state : DEJECTED **b** : directed toward or leading to ruin, destruction, or damnation (a man on the ~ path) (took her ~ way) **c** : DEBASING (the scripture contains many ~ comparisons of man and his ways) **4** *archaic* : being below : LOWER — **down·ward·ly** *adv* — **down·ward·ness** *n* -ES

1**downwarp** \(ˈ)-,-\ *vb* [1*down* + *warp*, v.] *vt* : to cause or produce a downwarp in ~ *vi* : to undergo downwarping

2**downwarp** \ˈ-,-\ *n* : a broad generally shallow geological downfold

downwash \ˈ-,-\ *n* **1** : material washed downward (as from a mountainside) **2** *aeronautics* : the airstream which is

glad·stone \'gladz,tōn, -d,st-, *chiefly Brit* -,tən\ *or* **gladstone bag** *n* -s *often cap G* [after William E. *Gladstone* †1898 Brit. statesman] : a traveling bag typically of leather and about two feet long with flexible sides on a rigid steel frame and opening flat into two equal compartments

gladstone

glad·sto·ni·an \(')gladz'tōnēən, -d;st-\ *adj*, *usu cap* [William E. *Gladstone* †1898 + E *-ian*] : of, relating to, or characteristic of W.E.Gladstone, his political policies, or the party that supported him

glady *also* **glad·ey** \'glādē\ *adj* **gladier; gladiest** [*glade* + *-y*] **1 a** : having glades; *esp* : full of glades ⟨a ~ countryside⟩ **b** : resembling a glade ⟨it was a ~ place, and ferns and moss grew all around —H.E.Giles⟩ **2** : having a shallow soil and limestone outcrops ⟨extensive ~ areas wherein well-preserved fossils are abundant —*Jour. of Geol.*⟩

gla·gah *or* **gla·ga** \'glägə\ *n* -s [Malay *glâgah*] : KANS

glag·o·lit·ic \¦glagə¦lid·ik\ *also* **glag·o·lith·ic** \-lithik\ *adj*, *usu cap* [irreg. fr. Serbo-Croatian *glagolica* Glagolitic alphabet + E *-ic*] : written in, constituting, or belonging to an alphabet of which the invention is attributed to St. Cyril in the 9th century A.D. and which was formerly used in writing various Slavic languages but is now used only in Catholic liturgical books in a limited area along the eastern coast of the Adriatic — compare CYRILLIC ALPHABET

gla·go·li·tsa \glə'gōlyētsə, -,ää\ *n* -s *usu cap* [Serbo-Croatian *glagolica*; akin to OSlav *glagolŭ* word, *glasŭ* voice — more at CALL] : the Glagolitic alphabet

glaik \'glāk\ *n* -s [origin unknown] **1 glaiks** *pl*, *chiefly Scot* : derisive deception : MOCKERY **2** *chiefly Scot* : a flash of light

glai·kit *or* **glai·ket** *or* **gla·ked** \'glākət, -əd\ *adj* [ME (Sc) *glaikit*, *glaikit*] *chiefly Scot* : showing a lack of common sense and good judgment : FOOLISH, SILLY, GIDDY

[1]**glair** *or* **glaire** \'gla(a)(ə)r, -le(, |a\ *n* -s [ME *gleyre* white of an egg, fr. MF *glaire*, fr. OF, modif. of (assumed) VL *claria*, fr. L *clarus* clear — more at CLEAR] **1** : a sizing liquid made from egg white beaten with vinegar and applied to book covers before laying on gold leaf or to book edges before gilding **2** : a viscid or slimy substance suggestive of the white of an egg

[2]**glair** *or* **glaire** \"\ *vt* -ED/-ING/-s : to apply glair to ⟨~*ed* book edges⟩

glair·e·ous \|rēəs\ *adj* [[1]*glair* + *-eous*] *archaic* : GLAIRY

glair·i·ness \|rēnəs\ *n* -ES : the quality or state of being glairy

glairy \|rē\ *adj* -ER/-EST [[1]*glair* + *-y*] **1** : having the characteristics of glair : VISCID, SLIMY ⟨~ mucus⟩ **2** : overlaid with or as if with glair ⟨a sticky ~ surface⟩

glais·tig *or* **glas·tig** \'glashtig\ *n* -s [ScGael *glaistig*] : a female sprite in Celtic mythology

glaive \'glāv\ *n* -s [ME *glaive*, *gleyve*, fr. OF *glaive* javelin, modif. of L *gladius* sword — more at GLADIATOR] **1** *obs* : HALBERD **2** *archaic* : SWORD; *esp* : BROADSWORD

glaiz·ie \'glāzi\ *Scot var of* GLAZY

glam \'glam\ *var of* GLAUM

gla·mor·gan·shire \glə'mȯrgən,shi(ə)r, -,shər\ *or* **glamorgan** *adj*, *usu cap* [fr. *Glamorganshire*, *Glamorgan*, county in Wales] : of or from the county of Glamorgan, Wales : of the kind or style prevalent in Glamorgan

glam·or·iza·tion \,glamərə'zāshən, -,rī'z-\ *n* -s : the act of glamorizing or the process of being glamorized

glam·or·ize *also* **glam·our·ize** \'**,rīz\ *vt* -ED/-ING/-s **1** : to make glamorous : add glamour to : make more attractive esp. in a superficial illusory way ⟨*glamorizing* a living room⟩ **2** : to attribute glamour to : look upon as glamorous : view or treat (as in writing) romantically : IDEALIZE, ROMANTICIZE, GLORIFY ⟨*glamorizing* war⟩ ⟨poverty *glamorized* into something alluring —Rose Thurburn⟩ — **glam·or·iz·er** \-zə(r)\ *n* -s

glam·or·ous *also* **glam·our·ous** \'glam(ə)rəs\ *adj* : characterized by or full of glamour : FASCINATING, ENCHANTING, ALLURING ⟨~ movie stars⟩ — **glam·or·ous·ly** *adv* — **glam·or·ous·ness** *n* -ES

[1]**glam·our** *or* **glam·or** \'glamə(r)\ *n* -s [Sc *glamour*, *glamer*, alter. of E *grammar*; fr. the popular association of erudition with occult practices] **1** : a magic spell : BEWITCHMENT ⟨the girls appeared to be under a ~ —Llewelyn Powys⟩ ⟨casting a ~ over the affairs of merchant princes —O.S.J.Gogarty⟩ **2** : an elusive mysteriously exciting and often illusory attractiveness that stirs the imagination and appeals to a taste for the unconventional, the unexpected, the colorful, or the exotic ⟨the ~ of the French Foreign Legion⟩ : a strangely alluring atmosphere of romantic enchantment ⟨a beautifully decorated room that was filled with ~⟩ : a bewitching intangible irresistibly magnetic charm ⟨it was simply the ~ of the unknown that she had felt in him —Ellen Glasgow⟩; *often* : personal charm and poise combined with unusual physical and sexual attractiveness ⟨an actress radiant with ~⟩

[2]**glamour** \"\ *vt* **glamoured**; **glamoured**; **glamouring** \-m(ə)riŋ\ **glamours** [Sc, fr. *glamour*, *glamer*, *n.*] **1** : to cast a magic spell upon : BEWITCH ⟨soon created such a realm of gorgeous marvel as ~*ed* the age with fantasy —H.B.Alexander⟩ **2** : GLAMORIZE ⟨*glamoured*-up blondes were a dime a dozen — Raymond Chandler⟩

glamour boy *n* : a man (as an actor or adventurer) with whom glamour is esp. associated

glamour girl *n* : a woman (as an actress or model) with whom glamour is esp. associated

glam·ou·rie *or* **glam·ou·ry** \-mərē\ *n*, *pl* **glamouries** [Sc, alter. of *glamour*, *glamer*, *n.*] *archaic* : GLAMOUR 1

glam·our·less \-mə(r)ləs\ *adj* : devoid of glamour ⟨she was handsome in her ~ way —Edmund Wilson⟩

glamour puss *n*, *slang* : one that has a glamorously attractive face ⟨some *glamour puss* with two expressions and eighteen changes of costume —Raymond Chandler⟩

[1]**glance** \'glan(t)s, -aa(ə)-, -ai-, -ä-\ *vb* -ED/-ING/-s [alter. of ME *glencen*, *glenchen*, perh. alter. of *glenten* to move quickly esp. in an oblique direction, strike something obliquely and glance aside, look sideways at something, gleam — more at GLENT] *vi* **1 a** (1) : to strike a surface obliquely so as to be deflected and go off at an angle : RICOCHET — usu. used with *off* ⟨the spear *glanced* off the heavy metal shield⟩ ⟨the bullet *glanced* off the stone wall and smashed through a window⟩ (2) : to strike a surface obliquely and bound onward at an angle often following with one or more additional oblique impacts and forward bounds : SKIP ⟨threw the small flat stone so that it *glanced* lightly across the pond⟩ (3) *of a ray of light* : to strike a reflecting surface obliquely and dart out at an angle ⟨light from the setting sun *glanced* off the oil tanks —Malcolm Lowry⟩ **b** (1) *obs* : to move swiftly (as in springing or dodging) esp. in an oblique or crosswise direction (2) : to make a glance in cricket **c** *archaic* : to move swiftly (as in speaking or writing) from one subject to another **2 a** (1) : to flash or gleam with quick intermittent rapidly successive rays of light (as those produced by sudden quick movements of a reflecting surface) : SPARKLE, SCINTILLATE, CORUSCATE ⟨clear mountain brooks *glancing* brightly in the morning sun⟩ (2) : to make sudden quick movements that cause quick intermittent flashes of light (as from a moving reflecting surface) ⟨dragonflies *glancing* and zigzagging over the pond⟩ **b** : to shine with a steady dazzling radiance : BEAM ⟨the *glancing* sun⟩ **3 a** : to touch briefly or indirectly on a subject (as in speaking or writing) : make an incidental reference : make an allusion — usu. used with *at* ⟨a book on contemporary civilization that often ~s at the customs of ancient cultures⟩ **b** : to refer briefly to something by way of censure or satire : cast discredit on something in a passing reference ⟨full of sly, *glancing* allusions to life as it is lived today —Gerald Bullett⟩ **4 a** *of the eyes* (1) : to move swiftly from one thing to another ⟨his eyes *glanced* from the judge to the jury and back again⟩ (2) *archaic* : to light upon something by or as if by chance ⟨her eye *glanced* on something which made her change color —T.L.Peacock⟩ **b** : to take a quick look at something ⟨*glancing* at the morning headlines⟩ : look briefly, hurriedly, or cursorily ⟨*glanced* about as though fearful of being overheard —Sherwood Anderson⟩ : look around here and there : make a quick inspection ⟨the bar, where we *glanced* first, was crowded —Scott Fitzgerald⟩ — *vt* **1 a** *obs* : to turn (the eyes or gaze) quickly aside or away **b** *archaic* : to turn (the eyes or gaze) quickly or briefly toward something **c** *archaic* (1) : to take a quick look at : view quickly : survey rapidly (2) : to catch a glimpse of **2** *obs* **a** : to allude to **b** : to barely touch : GRAZE **3** : to give an oblique path of direction to: **a** : to throw (as a spear or stone) or shoot (as a bullet) so that the object thrown or shot glances from a surface **b** *archaic* : to aim (as an innuendo) indirectly : INSINUATE **4** *archaic* : to cause the reflection of ⟨*glanced* back the flame of the lamp merrily —Sir Walter Scott⟩ **5** : to play (a bowled cricket ball) with a glance

[2]**glance** \"\ *n* -s **1 a** (1) : a quick intermittent flash or gleam of light (as one produced by sudden quick movements of a reflecting surface) ⟨the ~ of a brightly polished sword⟩ (2) *archaic* : a sudden quick movement (as of a reflecting surface) that produces flashes or gleams of light **b** : a ray of light shining with a steady radiance : BEAM ⟨the first ~ of sunlight sends the snow slithering in soft cascades —Adrian Bell⟩ **2 a** *archaic* : a rapid oblique or crosswise movement **b** *archaic* : a deflected impact or blow **c** : a stroke in the game of cricket made with a slanted bat that deflects the ball to leg **3 a** : a swift movement of the eyes from one thing to another ⟨the suspect's shifting ~⟩ **b** : a quick, brief, hurried, or cursory look ⟨the two old ladies darting ~s at us and smiling secretively —William Thornton⟩ ⟨museums in which pictures of a single style or artist can be compared and enjoyed at a ~ —R.J.Goldwater⟩ ⟨it was clear at first ~ that his condition was serious —T.B.Costain⟩ **4** *archaic* **a** : a brief satirical or censorious reference to something : GIBE **b** : a brief incidental reference : ALLUSION

[3]**glance** \"\ *n* -s [G *glanz* mineral sulfide, luster, shine] : any of several mineral sulfides that are mostly dark colored and that have a metallic luster

[4]**glance** \"\ *vt* -ED/-ING/-s [prob. fr. D *glanzen* to polish, gleam, fr. MD *glansen* to gleam, fr. *glans*, *n.*, luster, shine, fr. MHG *glanz*, fr. OHG, fr. *glanz*, adj., bright — more at GLENT] : to give a high luster to (as by burnishing)

glance coal \'-,-\ *n* [trans. of G *glanzkohle*, fr. *glanz* luster, shine + *kohle* coal] : a hard lustrous coal; *esp* : ANTHRACITE

glance pitch *n* [[3]*glance*] : a pure asphalt — compare MANJAK

glanc·er \-sə(r)\ *n* -s [[1]*glance* + *-er*] : FENDER SKID

glancing *adj* [fr. pres. part. of [1]*glance*] **1** : INCIDENTAL, INDIRECT ⟨the book has a variety of ~ references to prominent personalities⟩ **2** : CASUAL, UNSTUDIED, OFFHAND ⟨a citizen of the world who knew the Near East with the same ~ familiarity —H.V.Gregory⟩ ⟨he evoked the town and its surrounding countryside with his habitual ~ art —*Times Lit. Supp.*⟩ — **glanc·ing·ly** *adv*

glancing angle *n* [*glancing* fr. gerund of [1]*glance*] : the angle between an incident beam (as of X rays or electrons) and the surface upon which it is incident : the complement of the angle of incidence

glancing boom *n* : FENDER BOOM

[1]**gland** \'gland, -aa(ə)-\ *n* -s [F *glande* gland (organ of secretion), glandular swelling esp. on the neck, fr. MF, acorn, gland (organ of secretion), glandular swelling esp. on the neck, fr. OF, acorn, glandular swelling esp. on the neck, fr. *glant*, *gland* acorn, fr. L *gland-*, *glans*; akin to Gk *balanos* acorn, Lith *gilė*] **1 a** : a cell or group of cells that selectively removes materials from the blood, concentrates or alters them, and secretes them for further use in the body or for elimination from the body and that typically consists of columnar or cuboidal epithelium resting on a basement membrane that is surrounded by a plexus of blood vessels — see ENDOCRINE, EXOCRINE, HOLOCRINE, MEROCRINE **b** : any of various animal structures suggestive of glands though not glandular in function: as (1) : LYMPH GLAND (2) : GLANS **c glands** *pl* : a diseased or inflamed condition of glands (as the lymph or salivary glands of the neck) **2 a** : any of various special secreting organs of plants: as (1) : one or more of the hairs on the leaves of sundew (2) : one or more of the extrafloral nectaries of many plants **b** : any of certain small protuberances of plants (as on the petiole of a peach leaf)

[2]**gland** \"\ *n* -s [origin unknown] **1** : a device (as a series of carbon rings or of interlocking teeth) for preventing leakage of steam, water, gas, or other fluid past a joint (as in machinery); *specif* : the movable part of a stuffing box by which the packing is compressed **2** : a short tube fitted to the envelope of a balloon or airship so that a rope may slide through without causing leakage

glan·dered \'glandə(r)d, -laan- *sometimes* -län-\ *adj* : affected with glanders ⟨a ~ horse⟩

glan·der·ous \-d(ə)rəs\ *adj* **1** : GLANDERED **2** : produced by or resembling the effects of glanders ⟨a ~ condition⟩

glan·ders \-də(r)z\ *n pl but sing or pl in constr* [MF *glandres*, pl. of *glandre* glandular swelling esp. on the neck, fr. OF, fr. L *glandula*, dim. of *gland-*, *glans* acorn] : a highly contagious and very destructive disease of horses and other equines or sometimes of other animals (as dogs, guinea pigs, or man) that is caused by a bacterium (*Actinobacillus mallei* syn. *Malleomyces mallei* or *Pfeifferella mallei*) and that is characterized by caseating nodular lesions which tend to break down and form ulcers in mucous membranes, skin, and visceral organs and esp. in lymph nodes and along the course of lymphatic vessels and which may be accompanied by fever and edema and secondary symptoms referable to pulmonary, gastrointestinal, or other special organ involvement — compare FARCY

glandes *pl of* GLANS

gland·less \'glandləs, -laan-, *rapid* -nl-\ *adj* : devoid of glands

gland of bar·tho·lin \-,bär'tōlən\ *usu cap B* [after Kaspar *Bartholin* †1738 Dan. physician] : either of two oval racemose glands lying one on each side of the lower part of the vagina and secreting a lubricating mucus

gland of bow·man \-'bōmən\ *usu cap B* [after Sir William *Bowman* †1892 Eng. ophthalmic surgeon] : any one of the tubular and often branched glands occurring beneath the sensory epithelium of the nose

gland of brunner *usu cap B* : BRUNNER'S GLAND

gland of cowper *usu cap C* : COWPER'S GLAND

gland of external secretion : EXOCRINE GLAND

gland of internal secretion : ENDOCRINE GLAND

gland of lieberkühn *usu cap L* : LIEBERKÜHN'S GLAND

gland of moll \-'mōl, -ō-,-ä-\ *usu cap M* [after Jacob A. *Moll* †1914 Du. ophthalmologist] : any of the small glands near the free margin of each eyelid regarded as modified sweat glands

gland of ty·son \-'tīs°n\ *usu cap T* [after Edward *Tyson* †1708 Eng. anatomist] : any of the small glands at the base of the glans penis that secrete smegma

glands *pl of* GLAND

glan·du·la \'glanjələ\ *n*, *pl* **glandu·lae** \-,lē, -,lī\ [NL, fr. L, glandular swelling esp. on the neck] : [1]GLAND 1; *esp* : a small gland

glan·du·lar \-lə(r)\ *adj* [F *glandulaire*, fr. *glandule* glandula, fr. L *glandula*] **1 a** (1) : of, relating to, or involving glands or gland cells ⟨~ cancer⟩ ⟨~ functions⟩ (2) : derived from glands or gland cells ⟨~ secretions⟩ **b** : having the characteristics or function of a gland ⟨~ tissue⟩ **c** : containing, bearing, or made up of glands or gland cells ⟨~ organs⟩ **2 a** : controlled or influenced by the secretions of glands; *esp* : resulting from abnormal functioning of glands ⟨the theory of ~ criminal behavior⟩ **b** : INNATE, INHERENT, INSTINCTIVE ⟨he had grown up with a ~ dislike for everything pretentious⟩ **c** : EARTHY, PHYSICAL; *esp* : SEXUAL ⟨he has adopted, as an interim substitute for love, an entirely ~ relationship with the proprietress of his café —W.M.Frohock⟩ — **glan·du·lar·ly** *adv*

glandular epithelium *n* : the epithelium that forms the secreting surface of a gland

glandular fever *n* : INFECTIOUS MONONUCLEOSIS

glan·du·lif·er·ous \¦glanjə¦lif(ə)rəs\ *adj* [obs. E *glandule* glandula, glandular swelling esp. on the neck (fr. MF, glandula) + E *-i-* + *-ferous*] : bearing small glands

glan·du·los·i·ty \,glanjə'läsəd·ē\ *n* -ES [L *glandulosus* glandulous + E *-ity*] : the quality or state of being glandulous

glan·du·lous \'glanjələs, -laan-\ *adj* [ME *glandelous*, fr. MF *glanduleux*, fr. L *glandulosus*, fr. *glandula* + *-osus* -ose] : GLANDULAR — **glan·du·lous·ness** *n* -ES

gla·nen·che·li \glə'neŋkə,lī\ *n pl*, *cap* [NL, fr. *glan-* (fr. Gk *glanis* sheatfish) + *-encheli* (fr. Gk *enchelys* eel) — more at ANGUIS] *in some classifications* : a suborder of Ostariophysi comprising the electric eels

glan·i·os·to·mi \,glanē'ästə,mī\ *n pl*, *cap* [NL, fr. *glanio-* (fr. Gk *glanis*) + *-stomi*] *in some esp former classifications* : an order of fishes consisting of the sturgeons

glans \'glanz, -aa(ə)-\ *n*, *pl* **glan·des** \-n,dēz\ [L *gland-*, *glans* acorn, glans penis — more at GLAND] **1 a** *or* **glans pe·nis** \-'pēnəs\ : a conical vascular body forming the extremity of the penis **b** *or* **glans cli·to·ri·dis** \-klə'tȯrədəs, -,klī'-\ : a conical vascular body forming the extremity of the clitoris **2** : a nut enclosed by or seated in an involucre

glar \'glär\ *var of* GLAUR

[1]**glare** \'gla(a)(ə)r, 'gle(, |ə\ *vb* -ED/-ING/-s [ME *glaren*; akin to MD & MLG *glaren* to gleam, glare, OE *glæs* glass — more at GLASS] *vi* **1 a** : to shine esp. by reflection with a harsh uncomfortably brilliant light ⟨the heat was terrific, the pavements *glared* —Aldous Huxley⟩ ⟨the town was baking and *glaring* in the somniferous New York heat —Edmund Wilson⟩ : shine with an intense disagreeable brightness ⟨the sun *glared* down relentlessly⟩ ⟨a single naked bulb *glared* pitilessly in the center of the room⟩ : shine blindingly ⟨shielding our eyes as we crossed the white sand beach that blazed and *glared*⟩ ⟨miles of frozen snow that *glared* in the morning sunlight⟩ **b** *archaic* : to stand out offensively : be unpleasantly conspicuous : OBTRUDE **2** : to stare with intense hostility, annoyance, or dislike : stare angrily or fiercely : GLOWER, SCOWL ⟨where two armies ~ at each other across a geographical line —Lindesay Parrott⟩ ⟨*glared* at him as he walked in late⟩ ~ *vt* **1** : to express (as hostility) by glowering or scowling ⟨*glaring* defiance at each other —J.B.Priestley⟩ **2** *archaic* : to cause to be sharply reflected **syn** see BLAZE, GAZE

[2]**glare** \"\ *n* -s **1 a** (1) : a harsh uncomfortably bright light or reflection of light : intense disagreeable brightness ⟨the unshaded bulbs threw a cheap yellow ~ over the walls —A.P. Gaskell⟩ ⟨the ~ of publicity⟩; *specif* : painfully bright sunlight ⟨the ~ on the meadows was as blinding as if it shone on tin —Jean Stafford⟩ (2) *archaic* : the quality or state of being lustrous or glistening : SHININESS **b** : cheap showy brilliance : GARISHNESS, GAUDINESS ⟨art was partly corrupted by the fondness for ~, expensiveness, and size —F.W.Farrar⟩ **2** : a fixed glowering look : a look expressive of intense hostility, annoyance, or dislike : an angry or fierce stare : SCOWL ⟨the baleful ~ of their eyes⟩ ⟨gave the jury a ~⟩

[3]**glare** \"\ *n* -s [prob. fr. [2]*glare*] : a surface, sheet, or glaze of glare ice

[4]**glare** \"\ *archaic var of* GLAIR

glare ice *n* [prob. fr. [3]*glare*] : ice that has a smooth slippery glassy surface ⟨sidewalks covered with *glare ice*⟩

glare·less \'·ləs\ *adj* : free from glare ⟨opaque ~ paper⟩

gla·re·o·la \glə'rēələ\ *n*, *cap* [NL, dim. of L *glarea* gravel; prob. akin to L *granum* grain — more at CORN] : a genus (the type of the family Glareolidae) of Old World shorebirds that comprises the pratincoles which are closely related to the coursers

glar·e·ole \'gla(a)rē,ōl\ *n* -s [NL *Glareola*] : PRATINCOLE

glareous *var of* GLAIREOUS

[2]**glar·e·ous** \'gla(a)rēəs\ *adj* [L *glarea* gravel + E *-ous*] : growing in gravelly soil ⟨~ plants⟩

glar·i·ness \'gla(a)rēnəs\ *n* -ES : the quality or state of being glary ⟨the ~ of the dusty roads⟩

glar·ing \'gla(a)riŋ, -ler-, -räŋ\ *adj* [ME *glaringe*, fr. *glaren* to glare + *-inge*, *-ing* -ing] **1** : marked by a fixed look of hostility, fierceness, or anger : GLOWERING, SCOWLING ⟨trembled at the sight of their ~ eyes⟩ **2 a** : shining with or reflecting a harsh uncomfortably bright light : blindingly bright ⟨~ spotlights⟩ ⟨the still surface of the ~ sea⟩ **b** (1) : showily brilliant : GARISH, GAUDY ⟨~ colors⟩ (2) : vulgarly ostentatious : blatantly crude ⟨the more raffish and ~ manners of the Regency —R.E. Roberts⟩ **3** : painfully obvious : too apparent not to be noticed : FLAGRANT ⟨the gullibility with which we perpetuate ~ errors —Joseph O'Connor⟩ ⟨the self-assurance I have mentioned appears at its most ~ in a stupid man —Albert Dasnoy⟩ : unavoidably noticeable : inescapably evident : CONSPICUOUS ⟨the contrast between their words and their deeds today is ~ —O.M.Green⟩ **syn** see FLAGRANT

glar·ing·ly *adv* : in a glaring manner ⟨the need is ~ apparent⟩

glar·ing·ness *n* -ES : the quality or state of being glaring ⟨embarrassed by the ~ of this error⟩

glary \'gla(a)rē, -ler-, -ri\ *adj*, *usu* -ER/-EST [[2]*glare* + *-y*] : shining with or reflecting a harsh uncomfortably bright light : full of glare : GLARING ⟨sun-scorched, ~, waterless pieces of rock —Harry Luke⟩

glase *obs var of* GLAZE

gla·se·ri·an fissure \gla|'zirēən-, glā|\ *n*, *usu cap G* [*glaserian* fr. Johann Heinrich *Glaser* †1675 Swiss anatomist + E *-ian*] : PETROTYMPANIC FISSURE

glas·gow \'glas(,)kō, -laa|, -lal|, -läl, |s(,)gō *also* 'glaz(,)gō or -laz-\ *adj*, *usu cap* [fr. *Glasgow*, city in Scotland] : of or from the city of Glasgow, Scotland ⟨the *Glasgow* shipyards⟩ : of the kind or style prevalent in Glasgow

glasite *usu cap*, *var of* GLASSITE

[1]**glass** \'glas, -aa(ə)-, -ai-, -ä-\ *n* -ES [ME *glas*, fr. OE *glæs*; akin to OHG *glas* amber, OE *glær* amber, ON *gler* glass, OE *geolo* yellow — more at YELLOW] **1 a** : an amorphous inorganic usu. transparent or translucent substance consisting typically of a mixture of silicates or sometimes borates or phosphates formed by fusion of sand or some other form of silica or by fusion of oxides of boron or phosphorus with a flux (as soda, potash) and a stabilizer (as lime, alumina) and sometimes metallic oxides or other coloring agents so that a mass is produced that cools to a rigid condition without crystallization and that may be blown, cast, pressed, rolled, drawn, or cut into various forms — see CROWN GLASS, FIBER GLASS, FLINT GLASS; compare CULLET, FRIT **b** : any of various inorganic or organic substances resembling glass esp. in transparency, hardness, and amorphous nature ⟨sodium phosphate ~⟩ ⟨organic ~*es* made from plastics⟩ — compare [2]GLAZE 2a **c** : a substance (as obsidian, pumice) produced by the quick cooling of an igneous magma **2 a** : something made wholly or almost wholly of glass: as (1) : a glass container; *esp* : a glass drinking vessel (as a tumbler or a goblet) (2) : a glass mirror : LOOKING GLASS (3) : a sheet of glass (as a windowpane, the plate-glass front of a display case, the glass covering of a picture) (4) : a shaped hollow protective glass covering (as the bell-shaped covering set over some clocks or plants, the chimney of most oil lamps) (5) : a slightly curved or flat piece of glass covering the dial of a watch or clock : CRYSTAL (6) : OPTICAL GLASS (7) : either piece of glass or other transparent material in a pair of glasses (8) : an hourglass or half-hour glass (9) : WEATHERGLASS **b** (1) : an optical instrument (as a telescope or microscope) or device that has one or more lenses and that is designed to aid in the viewing of objects otherwise wholly or partly incapable of being seen by the average eye ⟨the captain kept his ~ fixed on the nearby shore⟩; *specif* : BINOCULARS ⟨stole the captain's ~*es*⟩ (2) **glasses** *pl* : a device used to correct defects of vision (as nearsightedness) or to protect the eyes (as from glare, dust, flying sparks) and consisting typically of two pieces of glass designed to bend light rays or of two pieces of ordinary colored or plain glass or other transparent material that are supported by a bridge resting on the nose and by sidepieces extending over the ears ⟨she put her ~*es* on the table⟩ — often used with *pair* ⟨bought a new pair of ~*es*⟩; called also *eyeglasses*, *spectacles*; compare GOGGLES, PINCE-NEZ **3 a** : the quantity held by a glass container (as a drinking glass) : GLASSFUL ⟨drank two ~*es* of water⟩ **b** : the time required for one end of an hourglass or half-hour glass to empty ⟨the ship had been sighted two ~*es* earlier⟩ **4** : articles made of glass : GLASSWARE ⟨a sparkling new set of dinner ~⟩ : glass products ⟨famous for the manufacture of beautiful ~⟩ **5** *obs* : GLOSS **6** *obs* : the organ of sight : EYE

[2]**glass** \"\ *vb* -ED/-ING/-ES *vt* **1 a** (1) : to fit, set, or equip (as a window frame) with glass ⟨only three windows had been ~*ed*⟩ ⟨peered in through the ~*ed* upper half of the fruitshop door —I.S.Cobb⟩ (2) : to fit or equip with eyeglasses ⟨had been ~*ed* at an early age⟩ **b** : to cover or protect with glass ⟨~*ed* the picture before framing it⟩ : enclose, case, or wall with glass ⟨sunlight streamed into the porch which had been ~*ed* in⟩ **c** : to pack and seal hermetically in glass containers for preservation or transportation ⟨~*ed* fruits⟩ ⟨~*ed* coffee⟩ — compare [3]CAN 1a **2 a** : to cause to have a glassy surface or appearance : make glassy ⟨boredom ~*ed* his eyes⟩ **b** : to

ganzin, fr. It *organzino*, prob. fr. *Urgench*, town in Soviet Central Asia where [...] : a raw silk yarn [...] doubled and twisted in the reverse direction when plied that is used for warp threads in fine fabrics — compare [1]TRAM

or·gasm \'ȯ(r),gazəm\ *n* -s [NL *orgasmus*, fr. Gk *orgasmos*, fr. *organ* to grow ripe, swell, be lustful; akin to Gk *orgē* impulse, anger, OIr *ferc, ferg* anger, Skt *ūrj, ūrjā* nourishment, power, strength] **1 a :** intense or paroxysmal emotional excitement **b :** an instance or outburst of such excitement **2 a** *obs* **:** a condition of turgescence and physiologic excitement of a body part or organ **b (1) :** the climax of sexual excitement typically occurring toward the end of coitus; *specif* **:** the sudden release of tensions developed during coitus usu. accompanied in the male by ejaculation **(2) :** an instance of the occurrence of such a climax

or·gas·mic \(')ȯ(r)¦gazmik\ *adj* **1 :** like or suggestive of an orgasm **2 :** tending to produce an orgasm

or·gas·tic \-astik\ *adj* [fr. *orgasm*, after such pairs as E *sarcasm: sarcastic*] **:** of, relating to, or being an orgasm

or·geat \'ȯr,zhä\ *n* -s [F, fr. MF, fr. *orge* barley, fr. L *hordeum* — more at HORDEUM] **1 :** a nonalcoholic drink prepared from the sweetened juice of almonds and other flavorings (as orange blossom essence, rose water) and usu. served cold **2 :** a sweet almond-flavored nonalcoholic syrup used as a cocktail ingredient or food flavoring — called also *sirop d'orgeat*

or·gia \'ȯ(r)jēə, -)gēə\ *n, pl* **orgia** *also* **orgias** [L, pl. — more at ORGY] **:** ORGY 1, 2

or·gi·ast \'ȯ(r)jē,ast\ *n* -s [Gk *orgiastēs*, fr. *orgiazein* to celebrate orgies, fr. *orgia* orgies — more at ORGY] **:** one who celebrates orgies

or·gi·as·tic \¦ȯ(r)jē¦astik, -a(a)s-, -tēk\ *also* **or·gi·as·ti·cal** \-tȧkəl, -tēk-\ *adj* [Gk *orgiastikos*, fr. (assumed) *orgiastos* (verbal of *orgiazein*) + *-ikos*, -ic] **1 :** tending to produce wild emotion ⟨~ music⟩ **2 :** of or having the character or quality of an orgy — **or·gi·as·ti·cal·ly** \-tȧk(ə)lē, -tēk-, -li\ *adv*

orgn *abbr* organization

or·gone \'ȯr,gōn\ *n* -s [prob. fr. *orgasm* + *-one* (as in *hormone*)] **:** a vital energy held to pervade nature and to be accumulable for use by the human body by sitting in a specially designed box

orgue \'ȯ(ə)rg\ *n* -s [F, lit., organ, fr. L *organum* — more at ORGAN] **:** one of a number of long thick timbers pointed and shod with iron and formerly suspended over or in the vaulted passage behind a gateway to be let down in case of attack

or·gui·nette \¦ȯ(r)gə¦net\ *n* -s [irreg. (influence of F *orgue*) fr. [1]*organ* + *-ette*] **:** a small portable reed organ mechanically played by turning a crank

or·gu·lous \'ȯ(r)g(y)ələs\ *also* **or·gil·lous** \-gəl-\ *adj* [ME *orgeilus, orguilous*, fr. OF *orgueilleus, orguilleus*, fr. *orgueil, orguil* pride (of Gmc origin; akin to OHG *urguol* remarkable, distinguished) + *-eus* -ous] **1 :** PROUD, HAUGHTY ⟨such ~ vaunting is best cured by bloodletting —E.G.Bulwer-Lytton⟩ **2 :** SHOWY, SPLENDID ⟨the organ began — an ~ roll — and the academic procession passed slowly down the aisle —J.P. Bishop⟩ — **or·gu·lous·ly** *adv*

or·gy *also* **or·gie** \'ȯrjē, 'ȯ(ə)j-, -ji\ *n, pl* **orgies** [MF *orgie*, fr. L *orgia*, pl., fr. Gk *orgia*; akin to Gk *ergon* work — more at WORK] **1 :** secret ceremonial rites held in honor of any of various deities (as of ancient Greece) and characterized by ecstatic or frenzied singing and dancing — usu. used in pl. **2 :** a ritual observance or ceremony **3 :** drunken revelry **:** CAROUSAL **4 a :** a manifestation of excessive indulgence in some predilection ⟨an ~ of speechmaking⟩ ⟨indulge in an ~ of destruction⟩ **b :** a riotous display ⟨an ~ of pink stucco⟩

or·ham·wood \'ȯrəm,-\ *n* [*orham* prob. modif. of F *orme* elm (fr. L *ulmus*) + E wood — more at ELM] **:** AMERICAN ELM

ori- *comb form* [MF, fr. LL, fr. L *or-, os* mouth — more at ORAL] **1 :** mouth ⟨*ori*fice⟩ **2 :** mouth and ⟨*ori*facial⟩

-oria *pl of* -ORIUM

-o·ri·al \¦ōrēəl,¦ȯr-\ *adj suffix* [ME *-oriale*, fr. L *-orius* -ory + ME *-ale* -al] **:** of, belonging to, or connected with ⟨gress*orial*⟩ ⟨insess*orial*⟩

[1]**orib·a·tid** \ō'ribəd·əd, ¦ōrə¦bad-\ *or* **orib·a·toid** \ō'ribə,tȯid, ¦ōrə¦bad,ȯid\ *adj* [*oribatid* fr. NL *Oribatidae*; *oribatoid* fr. NL *Oribatoidea*] **:** of or relating to the Oribatoidea

[2]**oribatid** \"\ *n* -s [NL *Oribatidae*] **:** a mite of the superfamily Oribatoidea

ori·bat·i·dae \¦ōrə'bad·ə,dē\ *n pl, cap* [NL, fr. *Oribata*, type genus + *-idae*] *in some classifications* **:** a family of mites coextensive with the superfamily Oribatoidea

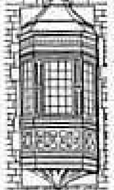
ori·ba·toi·dea \,ōrəbə'tȯidēə\ *n pl, cap* [NL, fr. *Oribata* (perh. fr. Gk *oreibatēs* mountain-ranging, fr. *oros* mountain + *-batēs*, fr. *bainein* to go) + *-oidea* — more at ORIENT, COME] **:** a superfamily of small oval eyeless nonparasitic mites having a heavily sclerotized integument with a leathery appearance

or·i·bi \'ōrəbē\ *also* **ou·re·bi** \'ūrə-\ *n* -s [Afrik *oribi*, prob. fr. Hottentot (Nama dial.) *arab*] **:** any of several small antelopes (genus *Ourebia*) of southern and eastern Africa that are tawny yellow above and white below and have straight annulated horns about five inches long

or·i·chalc *or* **or·i·chalch** \'ōrə,kalk\ *n* -s [L *orichalcum*, fr. Gk *oreichalkos*, lit., mountain copper, fr. *oros* mountain + *chalkos* copper — more at ORIENT, CHALC-] **1 :** a yellow metallic substance considered precious by the ancient Greeks **2 :** brass rich in zinc

or·i·chal·cum \,ōrə'kalkəm\ *n* -s [L] **:** ORICHALC

ori·el \'ōrēəl, 'ȯr-\ *n* -s [ME, porch, gallery, oriel, fr. MF *oriol* porch, gallery, prob. fr. ML *auleolum* niche, small chapel, dim. of *aula* court, hall, fr. L — more at AULA] **:** a large bay window of semihexagonal or semisquare plan projecting from the face of a wall and supported by a corbel or bracket



oriel

ori·en·cy \'ōrēənsē, 'ȯr-\ *n* -es [[1]*orient* + *-cy*] **:** the quality or state of being orient **:** BRILLIANCY

[1]**ori·ent** \'ōrēənt, 'ȯr-, -ē,ent\ *n* -s [ME, fr. MF, fr. L *orient-, oriens*, fr. pres. part. of *oriri* to rise, come forth — more at RISE] **1** *archaic* **:** the part of the firmament or of the world where the sun rises **:** EAST 1 — compare OCCIDENT **2** *usu cap* **:** EAST 2 ⟨sailed for the *Orient*⟩ **3** *archaic* **:** DAWN, SUNRISE **4 a :** a pearl of great luster **b :** the luster or sheen of a pearl **5 :** a moderate to strong blue that is redder than average Prussian blue

[2]**orient** \"\ *adj* [ME, fr. MF, *orient*, n.] **1** *archaic* **:** ORIENTAL 1 **2 a :** LUSTROUS, SPARKLING ⟨~ gems⟩ **b** *archaic* **:** GLOWING, RADIANT ⟨with ~ colors waving —John Milton⟩ **3** *archaic* **:** RISING ⟨the ~ moon —P.B.Shelley⟩

[3]**ori·ent** \-ē,ent *sometimes when no syllable-increasing suffix follows* -ēənt\ *vt* -ED/-ING/-S [F *orienter*, fr. MF, fr. *orient*, n.] **1 a :** to cause to face or point toward the east; *specif* **:** to build (as a church or temple) with the longitudinal axis pointing eastward and the chief altar at the eastern end **b :** to define the position of in relation to the east **c :** to set or arrange in any determinate position in relation to the points of the compass **d :** to ascertain the bearings of ⟨determined to get some distance up the ridge above the hut, to ~ myself with the country —Elyne Mitchell⟩ **2 :** to set right by adjusting to facts or principles **:** put into correct position or relation **:** acquaint with the existing situation ⟨will help freshmen to ~ themselves to college and to life —*advt*⟩ **3 :** to direct toward **:** place in relation to ⟨~ youth to the responsibilities of military service —*Amer. Child*⟩ **4 a :** to direct to a given position in a chemical compound esp. about a nucleus ⟨the *~ing* effect of the nitro group⟩ **b :** to ascertain the relative positions of atoms or groups in (a compound) **c :** to cause the axes of the molecules of (as a fiber or material) to assume the same direction ⟨~ a fiber by stretching⟩ ⟨highly *~ed* cellulose⟩ **5 :** to place (a crystal) so that its crystallographic axes lie in conventionally fixed directions **6 :** to rotate (a map attached to a plane table) until the line of direction between any two of its points is parallel to the corresponding direction in nature

[1]**ori·en·tal** \¦ōrē¦entᵊl, ¦ȯr-\ *adj* [ME, fr. MF, fr. L *orientalis* of [...] belonging to the [...] [1]orient + [...] -al] **1** *often cap* **:** of, relating to, or situated in the Orient — compare OCCIDENTAL **2 a :** of superior grade, luster, or value — used of pearls and other precious stones; compare OCCIDENTAL 3 **b :** GLOWING **c** *sometimes cap* **:** being corundum or sapphire but simulating another gem in color ⟨~ amethyst⟩ ⟨~ aquamarine⟩ ⟨~ emerald⟩ **3** *often cap* **:** of, relating to, or having the characteristics of Orientals ⟨maintain . . . an ~ politeness and a set smile which nothing can dispel or penetrate —Joseph Chiari⟩ **4** *usu cap* **:** of, relating to, or constituting the biogeographic realm or region that includes Asia south and southeast of the Himalayas and the Malay archipelago west of Wallace's line — **ori·en·tal·ly** \-ᵊlē, -li\ *adv*

[2]**oriental** \"\ *n* -s *usu cap* **1 orientals** *pl, obs* **:** oriental languages **2 :** a member of one of the indigenous peoples of the Orient (as a Chinese, Indian, or Japanese)

[3]**ori·en·tal** \,ōrē,en-'täl\ *n, pl* **ori·en·ta·les** \-ä,läs\ *usu cap* [AmerSp, fr. Sp, adj., easterner, fr. L *orientalis*] **:** URUGUAYAN

oriental arborvitae *n, usu cap O* **:** an Asiatic shrub or small tree (*Thuja orientalis*) having branchlets in vertical planes — compare AMERICAN ARBORVITAE

oriental beetle *n, usu cap O* **:** a small beetle (*Anomala orientalis*) of the family Scarabaeidae now established in the U. S. and having a larva that feeds on the roots of grasses and sugar cane

oriental bezoar *n, usu cap O* **:** a bezoar composed chiefly of resinous organic matter arranged in concentric layers about a hard foreign nucleus and found in the bezoar goat or the gazelle

oriental bittersweet *n* **:** a vigorous European climber (*Celastrus orbiculatus*) naturalized esp. in eastern No. America and having suborbicular to broadly obovate leaves with crenate teeth

oriental blue *n* **:** a strong blue that is redder and darker than Sèvres and redder and duller than cerulean blue (sense 1b) — compare ORIENT BLUE

oriental bole *n* **:** [1]BOLE 3

oriental cockroach *also* **oriental roach** *n, sometimes cap O* **:** a dark or blackish brown medium-sized cockroach (*Blatta orientalis*) prob. originating in Asia but now nearly cosmopolitan in warm and temperate areas esp. about dwellings — called also *Asiatic cockroach, blackbeetle*

oriental export porcelain *n, usu cap O* **:** LOWESTOFT WARE 2

oriental fruit fly *n* **:** a trypetid fly (*Dacus dorsalis*) that attacks many fruits, vegetables, and other plants in Hawaii, Formosa, the Philippines, and the Malay archipelago

oriental green *n* **:** a moderate to strong green

ori·en·ta·lia \,ōrēən-'tālyə, ,ȯr-, -ē,en-, -lēə\ *n pl, usu cap* [NL, fr. L, neut. pl. of *orientalis* oriental — more at ORIENTAL] **:** materials (as literary, artistic, archaeological products and remains) relating to the Orient

ori·en·tal·ism \-'entᵊl,izəm\ *n* -s *often cap* **1 :** a trait, custom, or habit of expression characteristic of oriental peoples **2 :** learning in oriental subjects **3 a :** an oriental turn of thought adopted by a western thinker **b :** a characteristic of oriental art or culture appearing in western practice

ori·en·tal·ist \-ᵊlȧst\ *n* -s *often cap* [*orientalism* + *-ist*] **:** a specialist in oriental subjects ⟨a very learned ~ —*Modern Language Notes*⟩

ori·en·tal·i·ty \-,en-'taləd·ē, -,en-\ *n* -es **:** the quality or state of being oriental

ori·en·tal·iza·tion \-,entᵊlə'zāshən, -ᵊl,ī'z-\ *n* -s *often cap* **:** the act or process of orientalizing or becoming orientalized

ori·en·tal·ize \-'entᵊl,īz\ *vb* -ED/-ING/-S *often cap* [[1]*oriental* + *-ize*] *vt* **:** to make oriental **:** give oriental qualities or characteristics to ⟨left the West far more *Orientalized* than the East was Hellenized —Elmer Davis⟩ ~ *vi* **1 :** to become oriental **:** adopt oriental traits or attitudes **2 :** to pursue oriental studies

oriental moth *n, usu cap O* **:** an Asiatic moth (*Cnidocampa flavescens*) of the family Eucleidae now established in eastern No. America and having a larva that feeds on fruit and some shade trees

oriental mustard *n* **:** INDIAN MUSTARD

oriental peach moth *or* **oriental fruit moth** *n, sometimes cap O* **:** a small moth (*Grapholitha molesta*) prob. native to Japan but now of nearly cosmopolitan distribution and having a larva that is injurious to the twigs and fruit of orchard trees and esp. to the peach

oriental pearl *n* **1 :** a true or natural marine pearl **2 :** SLATE GRAY

oriental plane *n, usu cap O* **:** a Eurasian shade tree (*Platanus orientalis*) with broad 5- to 7-lobed leaves and globose bristly fruiting heads produced in clusters of 3 to 7

oriental poppy *n, usu cap O* **:** an Asiatic perennial poppy (*Papaver orientale*) commonly cultivated and having stiff coarse heavily haired leaves and bright scarlet, pink, orange, or salmon-colored flowers

oriental rat flea *n* **:** a flea (*Xenopsylla cheopis*) that is widely distributed on rodents and is a vector of plague

oriental red *n* **:** GOYA

oriental rice borer *n* **:** a crambid moth (*Chilo simplex*) with a larva that is destructive to rice in southern and eastern Asia

oriental roller *n, usu cap O* **:** a tumbler pigeon originating in Asia Minor and having a longer head and tail than ordinary tumblers

oriental rug *or* **oriental carpet** *n, usu cap O* **:** a handwoven or hand-knotted one-piece rug or carpet made in the Orient esp. in Asia and usu. having a pile produced by knotting one or several tufts of colored woolen or silk yarn around one or usu. two warps of cotton or wool with a woof shot being passed over each row

oriental sore *n, sometimes cap O* **:** leishmaniasis of the skin caused by a protozoan (*Leishmania tropica*), marked by persistent granulomatous and ulcerating lesions, and distributed widely in the Orient and in tropical regions

oriental spruce *n* **:** an evergreen tree (*Picea orientalis*) of the Caucasus and Asia Minor that is used as an ornamental and has pendulous branchlets with brown pubescence

oriental topaz *n* **:** a yellow corundum used as a gem

orientalwood \,==ˈ==,=\ or **oriental walnut** *n, often cap O* **:** AUSTRALIAN WALNUT

ori·en·tate \'ōrēən,tāt, 'ȯr-, -ē,en-; ,==ˈen,tāt; usu -ād·+V\ *vb* -ED/-ING/-S [F *orienter* (fr. MF) + E *-ate* — more at ORIENT] *vt* **:** ORIENT ⟨when they come to London, colonials ~ themselves by Piccadilly Circus —Ngaio Marsh⟩ ~ *vi* **:** to face or turn to the east

ori·en·ta·tion \,==,en-'tāshən *also* -,en-\ *n* -s **1 a :** the directing or placing of something so as to face the east; *esp* **:** the building of a church or temple on an east-west axis with the chancel and main altar to the east **b :** the placing of a building in any determined relation to the points of the compass **2 a :** the act of determining one's bearings or settling one's sense of direction ⟨witnessed the bee's momentary pause for ~ before it headed back to the hive⟩ **b :** the settling of a sense of direction or relationship in moral or social concerns or in thought or art ⟨reflection conducive to the individual's intellectual and spiritual ~ —*College English*⟩ ⟨America has quite a different ~ toward new music —Ernst Krenek⟩ **3 :** choice or adjustment of associations, connections, or dispositions ⟨development toward a money ~ —W.E.Moore⟩ ⟨nations widely different in their political ~ —J.G.Colton⟩ **4 :** introduction to an unfamiliar situation **:** guidance in experience or activity of a new kind ⟨the ~ program set up for the benefit of new employes —*Dun's Rev.*⟩ **5 :** the change of position exhibited by some protoplasmic bodies within the cell in relation to external influences (as light or heat) or in relation to one another **6 a :** the relative positions of atoms or groups in a chemical compound esp. about a nucleus **b :** the determination of such positions — compare [3]ORIENT 4 **7** *psychiatry* **:** awareness of the existing situation with reference to time, place, and identity of persons — **ori·en·ta·tion·al** \¦==(,)=¦tāshənᵊl, -shnəl\ *adj*

ori·en·ta·tor \-ād·ə(r), -ātə-\ *n* -s **:** an apparatus in which a man seated in a partly enclosed box or cage can be subjected to the motions and stresses experienced by an airplane pilot in flight

orient blue *n* **1 :** a grayish blue that is redder and paler than electric, greener than copenhagen, and redder, lighter, and stronger than Gobelin — compare ORIENTAL BLUE **2 :** ORIENT 5

oriented *adj* [fr. past part. of [3]*orient*] **1 :** DIRECTED, RELATED [...] through [...] with these more recent tendencies to seek a common human ethics which will be valid for all mankind —Cornelius Kruse⟩ **2 :** having psychological orientation ⟨on the fourth day she was alert and ~ —Milton Rosenbaum⟩

ori·ent·er *or* **ori·en·tor** \'==,entə(r)\ *n* -s **:** one who assists a newcomer in adjusting to a social situation or to the local routine

orienting *pres part of* ORIENT

ori·en·tite \,==ˈen,tīt; '==ən,tīt, -,en-\ *n* -s [*Oriente*, province in eastern Cuba, its locality, + E *-ite*] **:** a mineral $Ca_4Mn_4Si_5O_{20}·4H_2O$ consisting of a hydrous calcium manganese silicate occurring in small brown orthorhombic crystals (hardness 4.5-5, sp. gr. 3)

oriently *adv, obs* **:** in an orient manner **:** CLEARLY, LUSTROUSLY

orientness *n* -es *obs* **:** the quality or state of being orient **:** BRILLIANCY

orient pink *n* **:** a moderate yellowish pink that is yellower and paler than coral pink and yellower and less strong than peach pink

orient red *n* **:** GOYA

orients *pl of* ORIENT, *pres 3d sing of* ORIENT

orient yellow *n* **:** CADMIUM YELLOW 2

-ories *pl of* -ORY

or·i·fice \'ōrəfəs, 'är-\ *n* -s [MF, fr. LL *orificium*, fr. L *or-, os* mouth + *-ficium* (fr. *-ficus* -fic) — more at ORAL] **:** the mouth or opening of something **:** APERTURE, HOLE, VENT ⟨was obviously the ~ of entrance, because its edges were torn and lacerated —Basil Thomson⟩ — see CLAM illustration

orifice box *n* **:** a stilling basin under the inlet to a reservoir

orifice plate *n* **:** a disk containing a calibrated circular hole bolted between two abutting pipe flanges to regulate flow

or·i·fi·cial \¦==¦fishəl\ *adj* **:** of or relating to an orifice

or·i·flamme \'ōrə,flam, 'är-, -läm(ə)m\ *n* -s [ME *oriflambe*, fr. MF *oriflambe, orieflambe*, fr. OF, fr. ML *aurea flamma*, lit., golden flame, fr. L *aurea*, fem. of *aureus* golden (fr. *aurum* gold) + *flamma* flame — more at ORIOLE, FLAME] **:** a banner inspiring lively devotion or courage **:** a bright or glorious ensign or symbol ⟨that gallant and chivalrous spirit that has streamed like an ~ through the storms of centuries —J.L.Lowes⟩

orig *abbr* origin; original; originally

ori·ga·mi \,ōrə'gämē\ *n* -s [Jap] **1 :** the art or process of Japanese paper folding **2 :** something (as a representation of a bird, insect, flower) made by origami

or·i·gan \-rəgən\ *also* **or·i·gane** \-,gan, -,gān\ *n* -s [ME *origane*, fr. MF *origan, origane* wild marjoram, fr. L *origanum*] **:** any of various aromatic mints (as wild marjoram)

[1]**orig·a·num** \ə'rigənəm, ō'-\ *or* **oreg·a·no** \ə'regə,nō, ō'-\ *n* -s [*origanum*, fr. ME, fr. L, wild marjoram, fr. Gk *origanon*; *oregano* fr. Sp *orégano*, fr. L *origanum*] **:** any of various fragrant aromatic plants of the families Labiatae and Verbenaceae that are used as seasonings in cookery; *usu* **:** WILD MARJORAM

[2]**origanum** \"\ *n, cap* [NL, fr. L, wild marjoram] **:** a genus of Eurasian aromatic mints having small erect spikes of flowers arranged in panicles or corymbs and the calyx almost equally 5-toothed — see CRETAN DITTANY, WILD MARJORAM; compare MAJORANA

origanum oil *n* **1 :** an essential oil obtained from various herbs of the genus *Origanum* formerly used in medicine and perfumery **2 :** THYME OIL

[1]**or·i·gen·i·an** \¦ōrə¦jēnēən, ¦är-, -jen-\ *adj, usu cap* [*Origen* †A.D. 254? Christian writer, teacher, and theologian + E *-an*] **:** of, relating to, or attributed to Origen

[2]**origenian** \"\ *n* -s *usu cap* **:** an adherent or follower of Origen

or·i·gen·ic \-¦jenik\ *adj, usu cap* [*Origen* †A.D. 254? Christian writer, teacher and theologian + E *-ic*] **:** ORIGENIAN

or·i·gen·ism \'==jə,nizəm, -,je,n-\ *n* -s *usu cap* [*Origen* †A.D. 254? + E *-ism*] **:** the doctrines held by or attributed to the 3d century Christian theologian Origen who sought to work out a complete Christian philosophy based on the Scriptures and developed largely along Platonic lines

[1]**or·i·gen·ist** \-,nəst\ *n* -s *usu cap* [LL *origenistes*, fr. *Origen* †A.D. 254? Christian writer, teacher and theologian + L *-istes* -ist] **:** an advocate of Origenism

[2]**origenist** \"\ *or* **or·i·gen·is·tic** \¦==(,)=¦nistik\ *adj, usu cap* [*origenism* + *-ist* or *-istic*] **:** of or relating to Origen or Origenism

or·i·gin \'ōrəjən, 'är-\ *n* -s [ME *origine*, prob. fr. MF, fr. L *origin-, origo*, fr. *oriri* to rise, come forth — more at ORIENT] **1 :** ANCESTRY, PARENTAGE ⟨was of humble ~⟩ **2 a :** rise, beginning, or derivation from a source ⟨had its ~ . . . when a tramp printer established it as a weekly —*Amer. Guide Series: Pa.*⟩ **b :** primary source or cause **:** FOUNTAIN, SPRING ⟨a letter found on his clothes tells us the ~ of the quarrel —George Meredith⟩ **3 :** the more fixed, central, or larger attachment or part of a muscle — compare INSERTION **4 a :** the intersection of the axes of Cartesian coordinates **b :** any arbitrary zero from which a magnitude is reckoned

syn SOURCE, INCEPTION, ROOT, PROVENANCE, PROVENIENCE, PRIME MOVER: ORIGIN applies to a person, situation, or condition that marks the beginning of a course or development, to the point at which something rises or starts, or, sometimes, to effective causes ⟨it is probable that the *origin* of language is not a problem that can be solved out of the resources of linguistics alone —Edward Sapir⟩ ⟨the exact *origin* of the pain is not definitely known since it might reasonably be expected to appear in any unyielding tissue or it could arise from distention of the joint cavity itself —H.G.Armstrong⟩ ⟨found the *origin* of faith in an undifferentiated feeling of the Infinite and Eternal —W.R.Inge⟩ SOURCE, often interchangeable with ORIGIN, may center attention on a point of ultimate beginning whence something rises, flows, or emanates ⟨this mystery and meaning of freedom, sin, and grace are the perennial *sources* of the religious life —Reinhold Niebuhr⟩ ⟨the *source* of infection was traced to the feeding to hogs of raw garbage from ships from the Orient —*Americana Annual*⟩ ⟨the probable *sources* of civilization, roughly the three great river valleys of the Nile, the Tigris and Euphrates, and the Indus —R.W.Murray⟩ INCEPTION stresses the notion of an initiating, starting, or beginning point without implication about causes ⟨joining the group at its *inception*⟩ ⟨tin miners, who had to bring coal from south Wales, used the Watt engine from the time of its *inception* —S.F.Mason⟩ ⟨has taken part in the United States atomic energy program since its *inception* in 1942 —*Current Biog.*⟩ ROOT may suggest a first, ultimate, or fundamental source, often one not patently evident ⟨several of the large foundations . . . have been spending hundreds of thousands of dollars to get at the *root* of the trouble —J.M.Barzun⟩ PROVENANCE and PROVENIENCE designate the area, sphere, or group in which something has originated or from which it is derived ⟨any layman who is sufficiently interested in the cheese he eats to inquire about its *provenance* must have noticed how much a monastery background improves a cheese —*New Yorker*⟩ ⟨relatively recent words of scientific *provenance*, e.g., appendicitis, iodine, quinine, and so on —H.L.Mencken⟩ ⟨the African *provenience* of northern Negroes —M.J.Herskovits⟩ PRIME MOVER may refer to an ultimate and original source of motive power that sets a thing moving; of personal agents it may refer to an inciter or instigator ⟨wind as the *prime mover* in impelling a sailing ship⟩ ⟨a committee on general education, in the organization of which your headmaster was a *prime mover* —A.W.Griswold⟩ ⟨evidence was also obtained implicating Heath as the *prime mover* in the affair and immediately upon Daniel's return the former was arrested —D.D.Martin⟩

[1]**orig·i·nal** \ə'rijənᵊl, -jnəl\ *n* -s [ME, fr. MF, fr. ML *originale*, fr. L *originale*, adj., original, neut. of *originalis*] **1** *archaic* **a :** the source or cause from which something arises **b :** PARENTAGE **c :** AUTHOR, ORIGINATOR **2** *archaic* **:** ORIGIN 2 **3 a :** a model, pattern, or archetype that is copied **b (1) :** a primary manuscript from which copies are made **(2) :** a direct impression produced by a typewriter esp. when made simultaneously with one or more carbon copies **c (1) :** the person or thing represented in a photograph or an artist's work **(2) :** a picture or work of art from which copies are made **4 :** a work composed firsthand **:** an artist's independent or spontaneous product ⟨caught up on their mail or . . .

out·turn \ˈ-,-\ *n* [¹*out* + *turn* (after *turn out*, v.)] **1 a** : an amount of something (as of a crop or manufactured item) turned out or produced ... crop . . . and extensive ... —J.S.Furnivall) **b** : a sampling taken at a paper mill from each run on a paper machine **2 a** : the quality or condition of something turned out or produced ⟨oiling of eggs has resulted in greatly improved ~ in the export pack and winter cold storage —*Poultry Farmer (Australia)*⟩ **b** : the condition in which a shipment arrives at its destination ⟨inaugurated special methods of stowing turpentine barrels in ships bound on long voyages, in order to assure better ~s —*Chem. Markets*⟩

out-turn \ˈ-,-\ *n* [¹*out* + *turn* (after *turn out*, v.)] : a moving curling stone which is rotating counterclockwise — compare IN-TURN

outvalue \(ˈ)-ˈ-(,)-\ *vt* [*out-* + *value*] : to be worth more than ⟨the talk ~s many a novel —Thomas Wood †1950⟩

outvie \(ˈ)-ˈ-\ *vt* [*out-* + *vie*] : to surpass in a rivalry or competition ⟨*outvying* each other in courtesy⟩

outvote \(ˈ)-ˈ-\ *vt* [*out-* + *vote*] **1** : to cast more votes than : defeat by a majority of votes ⟨these two groups can combine to ~ the other members of the board⟩ ⟨the outstate districts can ~ the city⟩ **2** : to defeat in a contest or on an issue decided by votes ⟨the cabinet must resign if it is *outvoted* —John Gunther⟩

outwait \(ˈ)-ˈ-\ *vt* [*out-* + *wait*] : to remain waiting longer than

outwake \(ˈ)-ˈ-\ *vt* [*out-* + *wake*] : to remain awake longer than : OUTWATCH

out-wale \ˈ-,wāl\ *n* [¹*out* + *gunwale*] : the outside piece of a gunwale (as of a canoe)

outwalk \(ˈ)-ˈ-\ *vt* [*out-* + *walk*] **1** : to outdo in walking ⟨could ~ those not nearly so old as he was —John Mason Brown⟩ **2** : to walk past or beyond ⟨~*ed* the furthest city light —Robert Frost⟩

outwall \ˈ-,-\ *n* [¹*out* + *wall*] **1** *archaic* : an outer wall or other enclosure **2** *obs* : the outer enclosure of a human being (as clothing or the body) ⟨I am much more than my ~ —Shak.⟩

outwander \(ˈ)-ˈ--\ *vt* [¹*out* + *wander*] : to wander out or away ⟨there is little ~*ing* or outgrowth from the tissues —*Science*⟩

1**out·ward** \ˈau̇twə(r)d\ *adj* [ME, fr. OE *ūtanweard*, *ūteweard*, *ūtweard*, fr. *ūtan* outside, from outside (fr. *ūt* out), *ūte* out, outside (fr. *ūt* out), & *ūt* out + *-weard* -ward — more at OUT] **1 a** : moving, directed, or turned toward the outside or away from a center ⟨the inward or ~ flow of money —*Jour. of Accountancy*⟩ ⟨the gradual ~ slope of the spur ridges —C.H. Hitchcock⟩ ⟨an ~ journey⟩ **b** : of or relating to a movement toward the outside ⟨the cost of returning a parcel includes postage, generally equivalent to the ~ charge —*Great Britain Post Office Guide*⟩ **2** : situated or lying on the outside of an enclosure or surface : EXTERIOR ⟨found the place where I was to lie . . . close and confined . . . and therefore lay all night in an ~ room —Tobias Smollett⟩ **3** : of or relating to the body and its surface appearance and clothing as opposed to the mind or spirit : BODILY, EXTERNAL ⟨~ man⟩ ⟨~ beauty⟩ ⟨~ form⟩ **4 a** : of or relating to an external act, activity, happening, or condition as distinguished from a mental or emotional process ⟨the chief ~ events of his life⟩ ⟨the new job represented a great improvement in his ~ status⟩ ⟨a feverish ~ display of energy⟩ **b** : of or relating to material objects as opposed to ideal concepts ⟨we alone wore ~ shackles —Mary Johnston⟩ **c** : of or relating to form as distinguished from essence ⟨began to find a recognized place in the ~ pattern of church life —*Eastern Churches Quarterly*⟩ **5** *dial Eng* : inclined to drink : DISSIPATED **syn** see OUTER

2**outward** \ˈ\ *or* **out·wards** \-dz\ *adv* [*outward* fr. ME, fr. OE *ūtanweard*, *ūteweard*, *ūtweard*, fr. *ūtanweard*, *ūteweard*, *ūtweard*, adj.; *outwards* fr. ME *outwardes*, fr. OE *ūteweardes*, fr. *ūtweard*, adj. & adv. + *-es* -s] **1 a** : toward the outside : away from a center or starting point ⟨the eternally ~ moving stars —*N.Y. Times*⟩ ⟨the city stretches ~ for many miles⟩ **b** : from the soul or mind toward external manifestation **2** *obs* : on the outside : EXTERNALLY ⟨they have a good cover, they show well ~ —Shak.⟩

3**out·ward** \ˈau̇twə(r)d\ *n* -s [¹*outward*] **1** : external form or appearance : OUTSIDE ⟨so fair an ~ and such stuff within —Shak.⟩ **2** : the material world ⟨can perceive the ~ and the inward, nature's good and God's —Robert Browning⟩

outward-bound \ˈ--ˈ-\ *adj* : bound in an outward direction or to foreign parts ⟨an *outward-bound* ship⟩ — **outward-bound·er** \-də(r)\ *n*

outward-flow turbine \ˈ--,-\ *n* : a water turbine in which the discharge stage of flow is away from the axis

out·ward·ly *adv* [ME, fr. *outward*, adj. + *-ly*] **1 a** : on the outside : EXTERNALLY ⟨~ visible⟩ ⟨~ apparent⟩ **b** : toward the outside : in an outward direction ⟨we see ~ and represent the apparent nature of things —Herbert Read⟩ **2** : in outward state, behavior, or appearance ⟨his ~ more fortunate fellows —Kenneth Fearing⟩ ⟨~ diffident, inwardly dreamy —Jean S. Untermeyer⟩ ⟨~ a placid island —Patrick Smith⟩

out·ward·ness *n* -es **1** : the quality or state of being outward : EXTERNALITY ⟨the ~ of the world⟩ **2** : concern with or responsiveness to outward things ⟨hearty showmanship and all-around ~ —F.H.Gervasi⟩

outwash \ˈ-,-\ *n*, *often attrib* [¹*out* + *wash* (after *wash out*, v.)] **1 a** : detritus chiefly consisting of gravel and sand carried by running water from the melting ice of a glacier and laid down in stratified deposits : glaciofluvial drift **b** : meltwater from a glacier **2** : soil material washed down a hillside by rainwater and spread upon the more gently sloping adjacent land

outwash cone *or* **outwash fan** *n* : a cone-shaped or fanlike mass of outwash that is ordinarily found at the margin of a dwindling glacier or shrinking ice sheet

outwash plain *also* **outwash apron** *n* : a plain constructed of outwash that is ordinarily found on and beyond the distal side of a terminal or recessional moraine and that generally consists of a number of coalescing outwash fans

outwash train *n* : VALLEY TRAIN

outwatch \(ˈ)-ˈ-\ *vt* [*out-* + *watch*] **1** : to surpass in watching : maintain a longer vigil than ⟨~ his companions⟩ **2** : to maintain a vigil till after the disappearance or end of ⟨~ the moon⟩ ⟨~ the night⟩

outwear \(ˈ)-ˈ-\ *vt* [¹*out* + *wear*] **1** : to wear out or use up : consume or destroy by attrition or use : EXHAUST ⟨drops of water ~ stone⟩ ⟨the machinery has been *outworn*⟩ ⟨the rowers were *outworn*⟩ **2 a** [*out-* + *wear*] : to last longer in use than ⟨a fiber that ~s others⟩ **b** : to grow or develop beyond in course of time : OUTGROW, OUTLIVE ⟨in cases where tradition is notoriously *outworn* —W.C.Brownell⟩ **3** *archaic* : to take up the time of ⟨with sick longing all the night ~ —John Keats⟩

outweep \(ˈ)-ˈ-\ *vt* [¹*out* + *weep*] **1** *archaic* : to weep out ⟨like a cloud which had *outwept* its rain —P.B.Shelley⟩ **2** [*out-* + *weep*] : to surpass in weeping ⟨can ~ any woman⟩

outweigh \(ˈ)-ˈ-\ *vt* [*out-* + *weigh*] : to exceed in weight, value, or importance ⟨an ounce of custom ~s a ton of reason —William Hamilton †1856⟩ ⟨no dangers could ~ the advantages of steamboat transportation —*Amer. Guide Series: Ark.*⟩

outwell \(ˈ)-ˈ-\ *vb* [¹*out* + *well*] *vt*, *obs* : to pour out ~ *vi* : to well out

outwent *past of* OUTGO

1**outwick** \ˈ-,-\ *n* [¹*out* + *wick*] : a shot in curling in which a player's stone is made to hit the outer edge of another stone so as to drive the latter toward the tee — compare INWICK

2**outwick** \ˈ\ *vi* : to make an outwick

1**outwind** \ˈ-,-\ *n* [¹*out* + *wind*] : a wind from the sea

2**outwind** \(ˈ)-ˈ-\ *vt* [¹*out* + *wind*] : to put out of breath ⟨an ~*ed* runner⟩

outwing \(ˈ)-ˈ-\ *vt* [*out-* + *wing*] **1** : to outstrip or pass in flying **2** : OUTFLANK

outwinter \(ˈ)-ˈ--\ *vb* [¹*out* + *winter*] *vt* : to keep (cattle) outdoors in winter ⟨the cost of feeding ~*ed* cattle —T.H. Jackson⟩ ~ *vi* : to stay outdoors in winter ⟨the Jersey can ~ provided the climate is not very damp —F.D.Smith & Barbara Wilcox⟩

outwit \(ˈ)-ˈ-\ *vt* [*out-* + *wit*] **1** : to defeat or get the better of by superior cleverness or ingenuity : OVERREACH ⟨how best to ~ the youngster and set him to learning when he is not fully aware of it —G.N.Shuster⟩ ⟨three men, caught *outwitting* an innocent pinball machine with a powerful magnet —*Phoenix* ...⟩ **2** *archaic* ... seers and ~s sages —R.W.Emerson⟩ **syn** see FRUSTRATE

outwith \ˈ-,-\ *prep* [ME, fr. ¹*out* + *with*] **1** *chiefly Scot* : outside of : out of **2** *chiefly Scot* : EXCEPT

outwore *past of* OUTWEAR

1**outwork** \(ˈ)-ˈ-\ *vt* [¹*out* + *work*] **1** : to work out : COMPLETE ⟨saw, in web unbroken, its history *outwrought* —Thomas Hardy⟩ **2** [*out-* + *work*] *archaic* : to surpass in workmanship **3** [*out-* + *work*] : to outdo in working : work harder or faster than ⟨~s his competitors⟩

2**outwork** \ˈ-,-\ *n* [¹*out* + *work*] **1 a** : an outlying point of defense ⟨had been forced to abandon her ~s across the Rhine and the Danube —Richard Koebner⟩ ⟨impairs not only the ~s but the citadel of personality —Walter Moberly⟩ **b** : a small defensive position constructed outside a fortified area **2** : work done outside the shop or institution from which it is directed or for which it is performed

outworker \ˈ-,--\ *n* [¹*out* + *worker*] : one that works outside the institution or shop by which he is employed

outworld \ˈ-,-\ *n* [¹*out* + *world*] : the outside world

outworn \ˈ-ˈ-\ *adj* [fr. past part. of *outwear*] **1** : no longer useful or accepted : OUTMODED, OBSOLETE ⟨still attempted to cling to the ~ ethics professed at the dawning of the Gilded Age —J.D.Hart⟩ ⟨an ~ road⟩ **2** : worn out : used up : EXHAUSTED ⟨an ~ champion pugilist —Stanley Walker⟩

outwrestle \(ˈ)-ˈ--\ *vt* [*out-* + *wrestle*] : to defeat in wrestling : grapple with successfully

outwrite \(ˈ)-ˈ-\ *vt* [*out-* + *write*] **1** : to surpass in ability to write ⟨historian for historian, journalist for journalist, they ~ us —R.H.Rovere⟩ **2** [¹*out* + *write*] : to throw off or overcome by writing ⟨*outwrote* his depression⟩

outwrought *past of* OUTWORK

outyell \(ˈ)-ˈ-\ *vt* [*out-* + *yell*] : to yell louder than ⟨women quarreling and trying to ~ each other —H.L.Davis⟩

outyield \(ˈ)-ˈ-\ *vt* [*out-* + *yield*] : to surpass in yield ⟨fall-sown or winter oats matured earlier and ~*ed* spring oats —*Experiment Station Record*⟩

ouvarovite *var of* UVAROVITE

ou·vert \(ˈ)üˈve(ə)r\ *adj* [F, lit., open, fr. OF *overt* — more at OVERT] **1** *ballet* : having an open stance or movement **2** *card games* : OPEN 17b(2)

ou·zel *also* **ou·sel** \ˈüzəl\ *n* -s [ME *ousel*, *osel*, fr. OE *ōsle* — more at MERL] **1** : a European blackbird (*Turdus merula*) **2** : any of various thrushes or other birds that are related to the ouzel — see RING OUZEL, WATER OUZEL

ou·zo \ˈü(,)zō\ *n* -s [NGk *ouzon*] : a colorless anise-flavored unsweetened Greek liqueur that turns milk-white when mixed with water and ice

ov- *or* **ovi-** *or* **ovo-** *comb form* [L *ov-*, *ovi-*, fr. *ovum* — more at EGG] **1 a** : egg ⟨*ovejector*⟩ ⟨*oviform*⟩ ⟨*ovomucoid*⟩ **b** : ovum ⟨*ovocyte*⟩ ⟨*ovogenesis*⟩ **2** : ovally ⟨*ovo-elliptic*⟩

ov *abbr* ovum

OV *abbr* **1** oil of vitriol **2** over voltage

ova *pl of* OVUM

1**oval** \ˈōvəl\ *adj* [ML *ovalis*, fr. LL, of an egg, fr. L *ovum* egg + *-alis* -al] : having the shape of an oval : broadly elliptical ⟨an ~ ball⟩ — often used in combination ⟨an *oval-faced* child⟩ — **oval·ly** \-və(l)lē, -li\ *adv*

2**oval** \ˈ\ *n* -s **1** : a body or figure generally in the shape of the longitudinal section of an egg **2** : an object of oval or ellipsoidal shape: as **a** : a cartouche of an Egyptian king **b** (1) : a stadium, arena, or athletic field of oval shape (2) : RUNNING TRACK, RACETRACK


oval 1

3**oval** \ˈ\ *vb* **ovaled** *or* **ovalled**; **ovaled** *or* **ovalled**; **ovaling** \-v(ə)liŋ\ *or* **ovalling**; **ovals** *vt* : to make oval ~ *vi* : to become oval

ov·albumin \(ˈ)ōv+\ *n* [*ov-* + *albumin*] **1** : the principal albumin of white of egg; *esp* : the crystalline part of egg albumins — compare CONALBUMIN **2** : EGG ALBUMIN

ova·le \ōˈvālē\ *adj* [NL, specific epithet of *Plasmodium ovale*, fr. ML *ovale*, neut. of *ovalis* oval] : of, relating to, or caused by a malarial parasite (*Plasmodium ovale*)

oval·i·ty \ōˈvaləd-ē\ *n* -es [ISV ²*oval* + *-ity*] : the quality or state of being oval in shape : degree of departure from true circularity ⟨~ of a worn gun bore⟩

oval·ness \ˈōvəlnəs\ *n* -es : OVALITY

ovalo·cyte \ōˈvalə,sīt, ˈōvəl,ə-\ *n* -s [ISV ¹*oval* + *-o-* + *-cyte*] : an oval red blood cell normal in the camel and occurring as a rare hereditary anomaly in man — **ovalo·cyt·ic** \-ˈ-ˈsid-ik, ˈ---\ *adj*

ovalo·cy·to·sis \-,--sīˈtōsəs, ,--(,)--\ *n*, *pl* **ovalocyto·ses** \-ō,sēz\ [NL, fr. ISV *ovalocyte* + NL *-osis*] : a hereditary trait in man manifested by the presence in the blood of red blood cells which are oval in shape with rounded ends — compare SICKLE-CELL TRAIT

oval·oid \ˈōvə,lȯid\ *adj* [¹*oval* + *-oid*] : approximately oval

oval window *n* [trans. of NL *fenestra ovalis*] : the oval fenestra of the ear

ovari- *or* **ovario-** *also* **ovar-** *comb form* [NL, fr. *ovarium*] **1** : ovary ⟨*ovaritis*⟩ ⟨*ovariectomy*⟩ ⟨*ovariotomy*⟩ **2** : ovarian and ⟨*ovario-abdominal*⟩

ovar·i·al \(ˈ)ōˈva(a)rēəl, -ver-, -vār-\ *adj* [prob. fr. (assumed) NL *ovarialis*, fr. NL *ovari-* + L *-alis* -al] : of, involving, or affecting an ovary ⟨~ function⟩ ⟨~ poisons⟩

ovar·i·an \-ēən\ *adj* [prob. fr. (assumed) NL *ovarianus*, fr. NL *ovari-* + L *-anus* -an] : of or relating to an ovary

ovari·ec·to·mize \(,)ō,va(a)rēˈektə,mīz, ,ōvər-\ *vt* -ED/-ING/-S [*ovariectomy* + *-ize*] : to remove an ovary surgically from

ovari·ec·to·my \-,mē\ *n* -es [NL *ovariectomia*, fr. *ovari-* + *-ectomia* -ectomy] : the surgical removal of an ovary

ovar·i·ole \ōˈva(a)rē,ōl\ *n* -s [*ovari-* + *-ole*] : one of the tubes of which the ovaries of most insects are composed

ovar·io·testis \ō,va(a)rēō+\ *n* [NL, fr. *ovari-* + L *testis*] : OVOTESTIS

ovar·i·ot·o·my \(,)ō,va(a)rēˈäd-əmē\ *n* -es [NL *ovariotomia*, fr. *ovari-* + *-tomia* -tomy] **1** : surgical incision of an ovary **2** : OVARIECTOMY

ova·ri·tis \,ōvəˈrīd-əs\ *n*, *pl* **ova·rit·i·des** \-ˈrid-ə,dēz\ [NL, fr. *ovari-* + *-itis*] : inflammation of an ovary : OOPHORITIS

ovar·i·um \ōˈva(a)rēəm\ *n*, *pl* **ovar·ia** \-ēə\ [NL] *archaic* : OVARY

ova·ry \ˈōv(ə)rē, -ri\ *n* -es [NL *ovarium*, fr. L *ovum* egg + *-arium* -ary — more at EGG] **1** : the typically paired essential female reproductive organ that produces eggs and in vertebrates female sex hormones, that occurs in the adult human as an oval flattened body about one inch and one half long suspended from the dorsal surface of the broad ligament of either side, that arises from the Wolffian body, and that consists of a vascular fibrous stroma enclosing developing egg cells which in their later stages with nutricial structures constitute Graafian follicles **2** : the enlarged rounded usu. basal portion of the pistil or gynoecium of an angiospermous plant that bears the ovules and consists of a single carpel or of several united carpels — see FLOWER illustration

1**ovate** \ˈō,vāt, ˈävət\ *n* -s [modif. of Gk *ouateis*, pl., members of one of three classes of Gaulish bards, prob. of Celt origin; akin to OIr *fáith* seer, poet — more at VATIC] : one of a class of bards in Wales graduated in bardic lore and approved by a session of bards

2**ovate** \ˈō,vāt, *usu* -ād·+V\ *adj* [L *ovatus*, fr. *ovum* egg + *-atus* -ate] **1** : shaped like an egg : OVAL — often used in combination ⟨*ovate-oblong*⟩ ⟨*ovate-deltoid*⟩ **2** : having an outline like that of the longitudinal section of an egg with the basal end broader ⟨~ leaves⟩ — see LEAF illustration

1**ova·tion** \ōˈvāshən\ *n* -s [L *ovation-*, *ovatio*, fr. *ovatus* (past part. of *ovare* to exult, rejoice) + *-ion-*, *-io* -ion; akin to Gk *euazein* to shout for joy, *euoi*, interjection used in Dionysiac celebrations] **1** : a ceremony attending the entering of Rome by a general who had won a victory of less importance than that for which a triumph was granted **2** *archaic* : EXULTATION **3** : enthusiastic popular homage or a public expression of it : an enthusiastic popular reception or tribute ⟨received an ~ as he entered the hall⟩

2**ovation** \ˈ\ *vt* -ED/-ING/-S : to give an ovation ⟨will all be there . . . to ~ you —Barnaby Conrad⟩

ova·tion·al \ōˈvāshən°l, -shənəl\ *adj* : of or relating to an ovation ...

ov·ejec·tor *also* **ovi·jec·tor** \ˈōvə,jektə(r), -vē,j-\ *n* -s [ISV *ov-* + *ejector*; orig. formed as F *ovéjecteur*] : the terminal highly muscular part of the oviduct of many nematode worms that forces the egg through the genital pore — **ovejectoral** *adj*

ov·en \ˈəvən *sometimes* ˈəvᵊm *or* ˈəbᵊm\ *n* -s [ME, fr. OE *ofen*; akin to OHG *ofan* oven, ON *ofn*, Goth *auhns* oven, L *aulla* pot, Gk *ipnos* oven, Skt *ukhā* cooking pot] **1** *obs* : FURNACE **2 a** : a chamber of brick or stonework used for baking, heating, or drying **b** : a heated enclosure of varying construction used for such purposes: as (1) : a chamber in a stove used for baking or roasting (2) : a laboratory hot-air sterilizer

ovenbird \ˈ--,-\ *n* [*oven* + *bird*; fr. the shape of their nests] **1** : any of various So. American passerine birds of the genus *Furnarius* **2** : an American warbler (*Seiurus aurocapillus*) having olivaceous upper parts with a yellowish brown black-bordered crown, white underparts streaked with black and building a dome-shaped nest placed on the ground

oven dressed *adj* : ready for cooking : FULL-DRESSED ⟨*oven dressed* poultry⟩

ovendry \ˈ--,-\ *adj* [*oven* + *dry*, adj.] : dried at a temperature at or above that of boiling water (usu. 100 to 110°C or 212 to 230°F)

oven-dry \ˈ--ˈ-\ *vt* [*oven* + *dry*, v.] : to dry in an oven

ovenman \ˈ--,man\ *n*, *pl* **ovenmen** **1** : a baker who tends an oven **2** : a worker who bakes parts or products in an oven to harden and strengthen them or to harden their finish

ovenware \ˈ--,-\ *n* : dishes used for baking and serving food

oven wood *n* : BRUSHWOOD

1**over** \ˈōvə(r)\ *adv* [ME, adv. & prep., fr. OE *ofer*; akin to OHG *ubari*, *ubiri*, adv., over, *ubar*, prep., over, ON *yfir*, adv. & prep., Goth *ufar*, prep., over, L *super*, adv. & prep., over, Gk *hyper*, adv. & prep., Skt *upari*, adv. & prep., over, OE *ufan* above] **1 a** (1) : from one point to another across an intervening space or barrier ⟨sail ~ to England⟩ ⟨throw the ball ~⟩ ⟨galloped ~ to the scene —H.E.Scudder⟩ ⟨the major called the three ~ —C. G. De Van⟩ (2) : so as to pass down or forward and down ⟨went too near the edge and fell ~⟩ (3) : from inside to outside across the brim ⟨the soup boiled ~⟩ (4) : so as to bring the underside to or toward the top ⟨turned himself ~⟩ ⟨roll a stone ~⟩ ⟨turn the page ~⟩ (5) : in the opposite direction ⟨gave the order to put the helm ~ —A. A. & Mary Hoehling⟩ (6) : over the side of a ship ⟨put a boat ~ to come and look for you —R.F.Mirvish⟩ ⟨put the ladder ~ —Vincent McHugh⟩ (7) : from side to side : in diameter : ACROSS ⟨the mouth of the cave was about 12 feet ~⟩ (8) : so as to pass over a target and beyond ⟨the bullets fell short or went ~⟩ (9) : away from a vertical to a prone or inclined position ⟨knocked the boy ~⟩ ⟨the wall fell ~⟩ ⟨the ship heeled ~⟩ (10) : to one's home ⟨inviting fifteen or twenty of her friends ~ for fun and games —*N.Y. Times*⟩ **b** (1) : on the other side of an intervening space ⟨is ~ in England⟩ (2) : at some distance from a particular point : AWAY ⟨a fellow a couple of counties ~ —Brad Sebstad⟩ ⟨from two blocks ~ he could hear the thin wall —H.M.Brier⟩ ⟨the bomb hit the next pier ~ —R.O.Bowen⟩ **c** (1) : so as to pass or transfer from one person, side, activity, or opinion to another ⟨hand ~ the money⟩ ⟨theater orchestras . . . had gone ~ completely to it —*Amer. Guide Series: Wash.*⟩ ⟨endorsed it ~ to the . . . Housing Corporation —Warner Olivier⟩ ⟨turned it ~ to her daughter —*Amer. Guide Series: Ark.*⟩ ⟨went ~ to the opposition⟩ (2) : so as to achieve understanding, acceptance, support, or other desired effect — usu. used with *get* ⟨are not getting ~ to those whom we are addressing —A.T.Weaver⟩ ⟨get your effect and your meaning ~ to the orchestra —Warwick Braithwaite⟩ ⟨wants to get his own message ~ —W.F.Hambly⟩ (3) : into one's own possession : so as to be in control ⟨the university took it ~ —*Amer. Guide Series: Md.*⟩ ⟨took ~ after a revolt⟩ ⟨took ~ from a firm that had gone into liquidation —*Irish Digest*⟩ — compare TAKE OVER **d** : ASIDE ⟨throwing ~ traditional morality⟩ **2 a** : beyond, above, or in excess of some quantity or limit ⟨boys of twelve and ~⟩ **b** (1) : in or to excess : beyond the norm ⟨she was ~ canvassed —Peter Heaton⟩ ⟨they were seven minutes ~ —Goodman Ace⟩ (2) : INORDINATELY, EXCESSIVELY — often used in combination ⟨on his guard against *overquick* deductions —A.E.Duncan-Jones⟩ ⟨just naturally *overregisters* emotion —*Current Biog.*⟩ ⟨*over*-conservative traditionalists —John Arlott⟩ **c** : till a later time ⟨leave this new inquiry ~ till Monday —F.W.Crofts⟩ ⟨so glad you can stay ~⟩ **3 a** : ABOVE ⟨the plane was directly ~⟩ **b** : so as to cover, conceal, or affect the whole surface or expanse ⟨the original logs were boarded ~ —*Amer. Guide Series: Ark.*⟩ **4 a** : at an end — often used in the phrase *over with* ⟨hurrying to get the business ~ with⟩ **b** — used on a two-way radio circuit to indicate that a particular sentence or message is complete and that a reply is expected **5 a** (1) : from beginning to end : THROUGH ⟨read it ~ and let me know what you think⟩ (2) : in an intensive or comprehensive manner : THOROUGHLY ⟨the issue is worked ~ in the most . . . compelling scene of the play —Leslie Rees⟩ ⟨talk the matter ~⟩ **b** (1) : for a second or successive time : once more : AGAIN ⟨this work will have to be done ~⟩ ⟨read the difficult passage twice ~⟩ — often used in the phrase *over again* ⟨asked to recite the verse ~ again⟩ (2) : so as to be transformed or changed from a previous state or condition ⟨a man cannot make himself ~⟩

2**over** \ˈ\ *prep* [ME, adv. & prep., fr. OE *ofer* — more at ¹OVER] **1 a** (1) — used as a function word to indicate position higher up than and usu. directly above another object ⟨~ the elm tops in the west —Lucien Price⟩ ⟨towered ~ his diminutive mother⟩ ⟨leaned ~ the rampart⟩ (2) — used as a function word to indicate a surrounding condition or threatening prospect ⟨an atmosphere of doubt and uncertainty hung ~ the town⟩ (3) — used as a function word to indicate that the author's name is subscribed to a writing ⟨sent a letter to the paper ~ his own signature⟩ (4) : above the mental capacity or beyond the comprehension of — usu. used in the phrase *over the head of* ⟨his lecture was way ~ the heads of his audience⟩ **b** (1) — used as a function word to indicate submersion above a specified level ⟨~ his waist in water⟩ (2) — used as a function word to indicate extreme or acute embarrassment or difficulty of a specified kind ⟨~ head and ears in debt⟩ **2 a** — used as a function word to indicate the possession or enjoyment of authority, power, or jurisdiction in regard to some thing or person ⟨installed as minister ~ one of the largest congregations in the city⟩ ⟨unfailing in their service of those ~ them —E.R.Hughes⟩ **b** — used as a function word to indicate a relation of superiority, advantage, or preference to another ⟨the relative importance of the abstract ~ the pictorial —C.J. Bulliet⟩ ⟨taking an unprecedented lead ~ the other teams —*Current Biog.*⟩ ⟨this excess of wealth ~ population —W.P. Webb⟩; often used in the phrase *have it over* or *have it all over* ⟨the Britisher in America has it ~ the anthropologist —V.O. Key⟩ **c** — used as a function word to indicate suppression of or release from a passion, infatuation, or other strong feeling ⟨finally got ~ his mad⟩ ⟨never got ~ his love for the baroque —*Current Biog.*⟩ **d** — used as a function word to indicate someone or something that is overcome, circumvented, or disregarded in achieving an objective ⟨we got ~ him —Adrian Bell⟩ ⟨passed ~ the president's veto —*Current Biog.*⟩ **3 a** *archaic* : further than : BESIDES **b** : more than ⟨cost ~ five dollars⟩ **4 a** (1) : upon or down upon so as to rest, cover, or conceal from view ⟨~ which they throw a bridge of flowers —*Amer. Guide Series: La.*⟩ ⟨laid a blanket ~ the sleeping child⟩ ⟨a cap pulled low ~ his eyes⟩ ⟨got some blood ~ your face —Burt Arthur⟩ (2) : upon or down upon so as to change or otherwise influence in a pervasive manner ⟨don't know what has come ~ the girl⟩ (3) : ON, UPON ⟨bop people ~ the head —Bennett Cerf⟩ ⟨rap a child ~ the knuckles⟩ (4) — used as a function word to indicate change, variation, or difference from some other thing or period ⟨this year's copy contains no innovations ~ those in the past —*Springfield (Mass.) Daily News*⟩ ⟨a drop of three ~ 1936 —*Springfield (Mass.) Daily News*⟩ **b** (1) : at or to all the parts of the surface of : throughout a specified area ⟨the common toad is found ~ the entire state —*Amer. Guide Series: Minn.*⟩ ⟨packing and shipping concerns who sell the U.S. ~ —*Spokane (Wash.) Spokesman-Rev.*⟩ — often used with intensive *all* ⟨the rumor is all ~ Washington —*New Republic*⟩ ⟨votive chapels sprang up in his honor